

VOLUME 3 NUMBER 9 SEPTEMBER 1996

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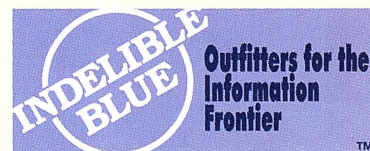
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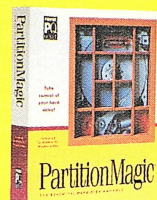
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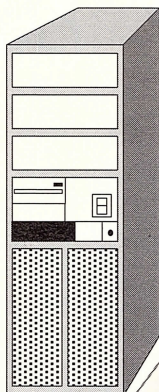


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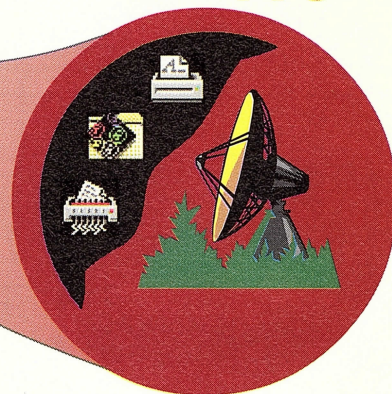
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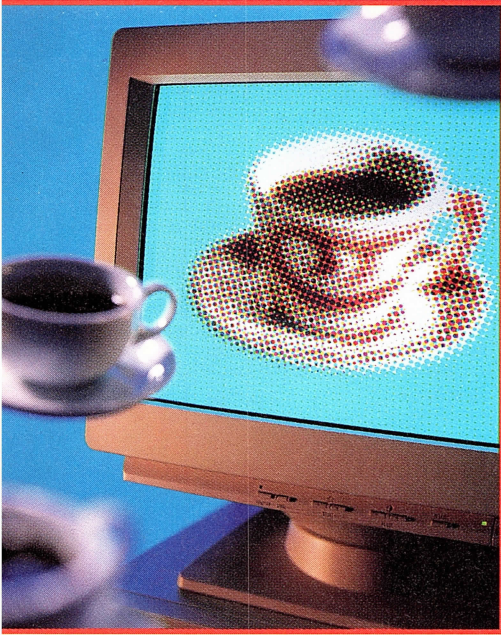
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We also maintain a Web-accessible database of OS/2-related products, the Software Solutions Directory. You can jump to it from our main home page or link to it directly at <http://www.mfi.com/softwareguide>.

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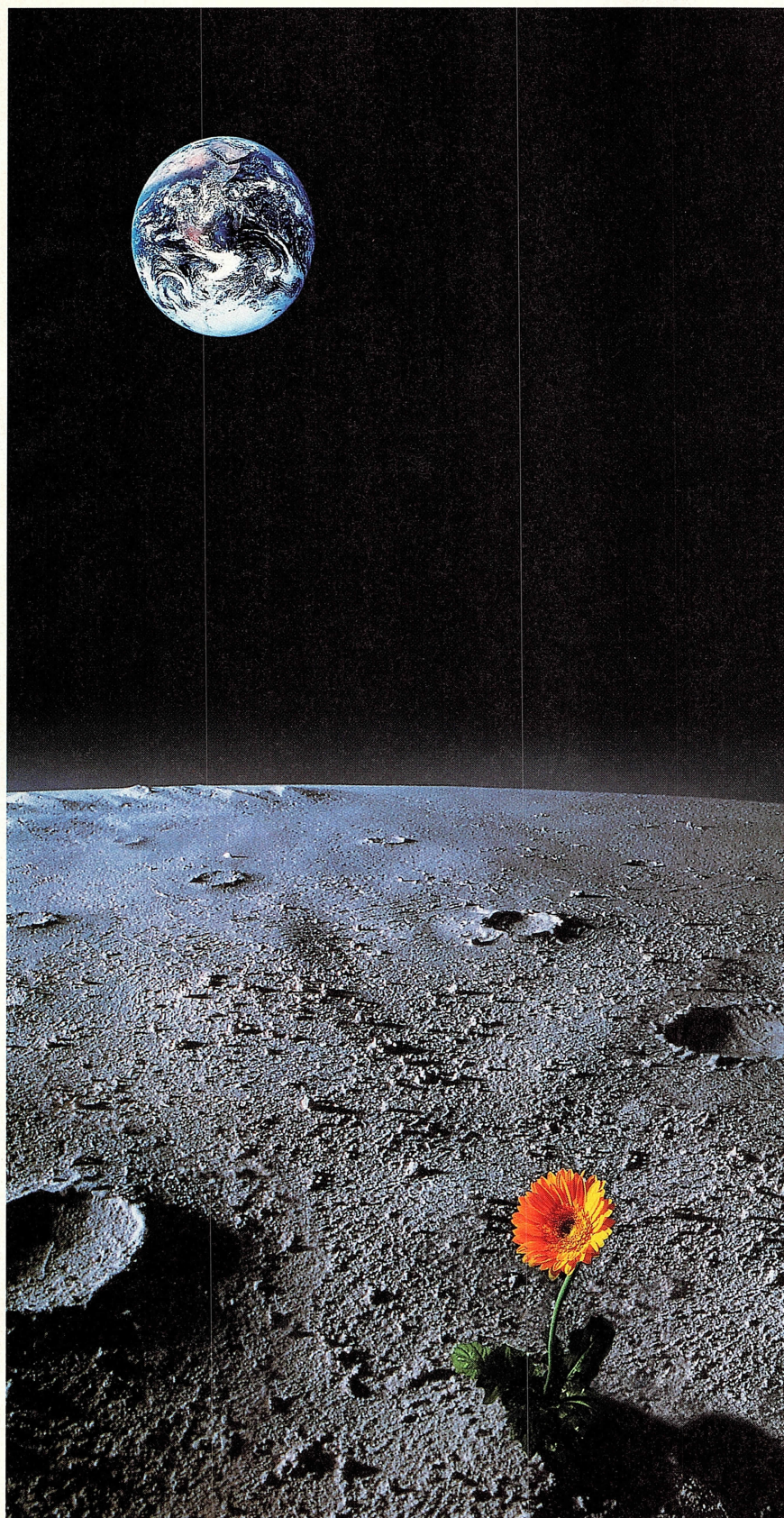
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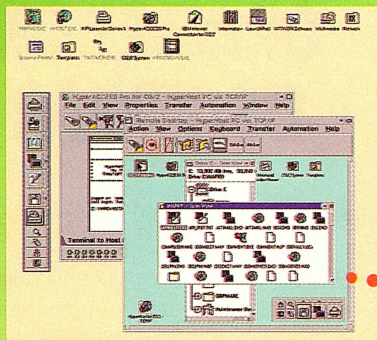
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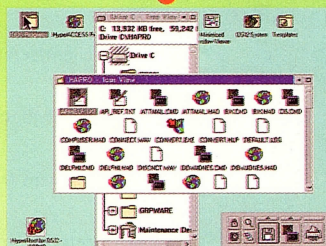
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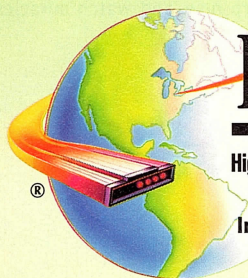
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# Perspectives

## The Sky is Falling

**I**s it just my imagination, or is the Internet slowing down?

**T**he Net is everywhere. A new Disney Classics audio CD referred us to the company's Web site for more music; every TV ad and grocery-store check-out coupon boasts a URL. Billboards overlooking downtown San Francisco extol the virtues of Infoseek, while posters plastered over an adjacent construction site rave about rival Yahoo. Signs on Highway 101 promote local Internet service providers (ISPs). Technology companies, from IBM to Microsoft to AT&T, talk more about the Internet than their previous core businesses (you remember, mainframes, office suites, and long-distance service). Print and broadcast media slobber over Web-based publishing. You just can't escape the Net.

Conventional wisdom says that if you're not online, you're irrelevant. That must be why I'm bombarded by hardware and software vendors wanting to brief me on their latest "Internet strategy."

Yet, somehow, nearly every Internet excursion ends not with a bang, but with a whimper.

**L**ast January, I was involved with a massive project to identify the best computer-related sites on the World Wide Web. For weeks, I ran key terms through various search engines, like Lycos and Alta Vista, and linked to hundreds of Web sites. It took forever! The search engines were slow, slow, s-l-o-w—literally unusable for hours at a time. Worse, many sites they "found" didn't exist. And although I was using the current IBM WebExplorer and Netscape Navigator clients, hot-linked pages were slow to load (and usually not worth the effort, but that's another story).

Months later, I'm still routinely frustrated when trying to access many Internet resources, whether using the corporate T-1 access, or dialing up through my local ISP. The "server not found" or "server not responding" messages appear with increasing regularity. The "Information Superhighway" of my July 1995 Perspectives is littered with potholes, broken glass, and unmarked dead ends.

I'm certainly not the first to make this observation. Bob Metcalfe, founder of 3Com and inventor of Ethernet, has been claiming for months that the Internet sky is falling. In his weekly *InfoWorld* columns, he's argued that the Internet backbone is overloaded, both for technical and business reasons, and he's predicted an imminent infrastructure collapse. (Recently, he estimated that as many as 40% of packets are lost during peak times). At first, I thought Mr. Metcalfe was overreacting; today, after a particularly futile attempt to log into a

few key sites, I'm beginning to agree. But is the sky really falling?

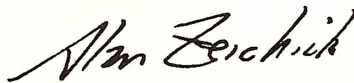
**T**he quantity of Internet traffic is growing rapidly. That's due in part to the fact that more people connect at work or play. What's more, the data transmissions themselves are becoming ever larger: VRML worlds aren't small. Pages include large graphics and sophisticated animations. Radio stations now broadcast in real time. Java's applets rival full-sized applications. Consumers hope to beat phone charges with Internet phone service. IS departments are testing server backup and mirroring over the Net. Apple is even developing a QuickTime Internet Movie Utility. The load only gets bigger, never smaller.

We OS/2 users are there on the forefront. Merlin has the best Internet hooks of any desktop operating system, and new OS/2 users will have high expectations. To paraphrase Vidal Sassoon, "If the Net doesn't look good, we don't look good."

How can you help? As a consumer, you're at the ISP's mercy. But if you manage Web sites or other Internet resources, make sure the connection from your server to the ISP is wide enough to carry the expected peak load (and that your ISP has the bandwidth, too). If necessary, partition your network to give the heaviest users and servers their own dedicated bandwidth. Keep your home page small enough to load in only a few seconds over a dial-up line (not everyone has ISDN or better). Cut down on unnecessary multimedia, store graphics in the smallest possible format, and make sure that text is displayed first. Test your pages using a variety of browsers, not only the latest WebExplorer. And aggressively solicit both content and performance feedback from your intended audience.

What about the Internet itself? Despite its problems, it's safe. Should Bob Metcalfe's dire predictions come true, I have no doubt that the Net's holes will be mended—and quickly, because of the size and nature of the vendors involved. Too many companies would lose too much money and prestige were the Net to collapse, and that's the best insurance policy of all.

So, although the sky's a little cloudy right now, it's not falling. What a fine day to sit back, fire up our favorite browsers, and go surfing (as long as it's not during peak time).



Alan Zeichick  
Editor-in-Chief







“Running OS/2 Warp Server on a Novell® network is like feeding it steroids.

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### Network

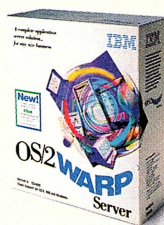
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# Letters

## The parting comment from the Technical Support rep was, "Good luck!"

### Gateway 2000

Dear Editor:

**T**he table on p. 24 of the July 1996 issue detailing PCs available with OS/2 preloaded indicates that Gateway 2000 will not preload OS/2 on its systems, but will guarantee compatibility with OS/2 and provide hardware support if OS/2 is installed by the customer.

My company recently bought 10 Gateway P5-100s, on which I tried to install OS/2. I was only able to make OS/2 work on one of them. When I called Gateway Corporate Technical Support, I was informed that Gateway didn't support OS/2 on its systems. The parting comment from the Technical Support rep was, "Good luck!"

I would strongly advise anyone who wants to run OS/2 to avoid Gateway 2000 PCs at all costs. Gateway's "flavor-of-the-day" components make it extremely difficult to get OS/2 installed and running, and the problems encountered are never consistent from one PC to the next.

I would be interested to know whether Gateway still maintains that it supports PCs with OS/2 installed by the customer. If that is indeed the case, someone needs to let their Technical Support staff know about it.

Mike Larsen  
Cedar Rapids, Iowa

*Gateway 2000 had this response to Mr. Larsen's letter:*

*Every time we release a component, we test it for OS/2—if there are drivers for it. If so, we include those drivers with the product. But we may include components that don't have OS/2 device drivers. We try to get the drivers as much as we can, but there are some things that just plain don't have OS/2 drivers. The idea is that the salesperson should know what works with OS/2 and what doesn't, and when a user says they want to run OS/2, the salesperson will only sell systems that have OS/2 device drivers for each component. In reality, that may not always happen,*

*but that's our goal. The salesperson has a list, which is getting smaller, by the way, of showstoppers and should guide the customer away from those.*

*We don't provide technical support for OS/2, or components added to a system after the user receives it. Tech support will most likely ask people to boot a DOS disk or something like that to help isolate it as a hardware problem rather than an OS/2 problem.*

Dave Reiss  
Software Team Leader  
Gateway 2000

### More Preloads

Dear Editor:

**W**e would like to inform you that we currently offer our full product line of systems with OS/2 Warp Connect preloaded (full retail version). One of our newest offerings is the ACI-686C 150+, which is delivered as follows: Cyrix 6x86 150+ CPU, 256 S-Burts Cache, 32MB EDO 60ns RAM, two EIDE Quantum Fireball hard drives, Adaptec 2940 SCSI controller, Toshiba CD-ROM, Imagine 128 with 4MB VRAM, 3.5-inch floppy, Colorado tape drive, full-tower case with front slide-out drives and two side doors for easy access to internal components, four cooling fans, 300 watt power supply, Hayes Accura 28.8 modem/fax.

Preben Nielsen  
President  
Ardec Inc.  
(209) 223-1180  
Fax (209) 223-3488

### FastLoad Update

Dear Editor:

**I**'m an avid OS/2 user—I'm running OS/2 Warp Connect on two machines—and fan of OS/2 Magazine. I love reading Tips and Tricks, even if the tips are sometimes obscure. I would like to add a little to the tip on FastLoad ("Faster Loading," Tip 243, July 1996, p. 19).

I had a bad experience with Fast-

Load (although I did figure out what was happening and fixed it).

I tuned my system for speed and optimized my memory within 16MB (I now have 32MB) on my office "server," where my data resides.

My accounting package is a Windows 3.1 application, based on Btrieve files, that uses a lot of resources. In my tuning, I trimmed the *config.sys* default Win/DOS settings to the barest minimum (that is, FILES=20) and set my Win/DOS settings in each Program Object as I tracked their individual characteristics (more FILES here, severe Idle Time restrictions there, less memory and CGA video over there, and so on). This method optimized my various VDMs within the then limited memory available.

I had a reasonably smooth system running—and then I tinkered too much! I switched on FastLoad as Tip 243 suggested, and suddenly the accounting application locked up or failed to load with a shortage of File Handles. Still, other Windows applications such as Quattro Pro had no problems, since they didn't need so many File Handles.

I finally traced the cause to the FastLoad feature, which has to use the default settings from the *config.sys* and whose settings cannot be expanded by later applications settings for the benefit of a shared session. (Separate sessions are exactly that and remain unaffected.)

So my caution to all Windows users is this: If you've tuned your system as I've outlined above, beware of FastLoad. In our case, starting a small application like the Calculator in the Startup Folder would achieve the required results.

But if you have not tweaked your *config.sys* Win/DOS settings defaults, you'll have all DOS and Win VDMs and Command Line sessions using the same, possibly wasteful, resources.

John Angelico  
Melbourne, Australia





# Maybe It's Time to Check Into a Good Recovery Program.

Needing intervention? A malfunctioning computer can cause dysfunctional behavior. Protect your work, your computer and your sanity with Back Again/2™, the ultimate backup and recovery for OS/2 Warp.

Now upgraded to version 4.0, you get all of BA/2's 32-bit power and broad device support, plus major enhancements. The integrated Workplace Shell Interface lets you back up and restore with "drag and drop" ease. Schedule any object such as a backup set, program, or REXX script to begin at a single date and time, a timed interval, or a combination of days at a chosen time. All by simply dragging it into the new Backup Scheduler folder! Configure any external command to execute before or after a backup is performed.

Ready for  
**OS/2 WARP**  
NSTL Tested

Estimate both backup time and size, plus many more configurable options.

And, BA/2 has enhanced its robust network support. It automatically finds network resources such as LAN Server and Netware File Servers. You can also back up LAN Server ACL (Access Control Lists) automatically.

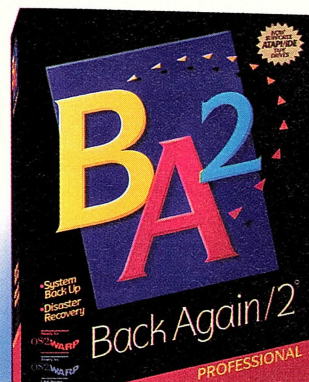
Now say this affirmation out loud, "Today I will buy BA/2 4.0, because I'm worth it." Preventive mental health begins with BA/2 4.0, the one-step recovery program.

Supports SCSI and ATAPI/IDE tape drives, networks, removable cartridges and floppy disks

System requirements: IBM OS/2 2.1 or greater

<sup>1</sup>BackAgain/2- Copyright CDS, Inc.

<sup>2</sup>OS/2 is a trademark of IBM

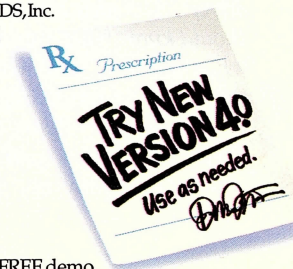


**CDS**  
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***It's Never too Late - With Back Again/2.***

For more info call CDS at 800-284-4156 or 612-730-4156. Visit our web site at <http://www.cds-inc.com> for a FREE demo.

Reader Service No. 6





# Trickle-Down Announcements

BY ALAN ZEICHICK

**C**ontrast, if you will, the differences between the months leading up to OS/2 Warp and Windows 95. IBM executives waited for nearly all the pieces to fall into place before saying anything; their reluctance to “pre-announce” meaningful details drove supporters to distraction—and chased reporters away in droves.

On the other hand, Microsoft concocted a headline story every week, which kept Chicago/Windows 95 on the front page of every computer magazine—and even landed Microsoft coverage in the broader media. The “news” was often superficial, of course, but reporters dutifully covered every minuscule detail, giving the perception that Windows 95 was an unstoppable juggernaut.

IBM started down its same old path with Merlin, now called OS/2 Warp 4.0. At last November’s COMDEX, the company held a press briefing about OS/2’s future, showing sample screen shots—and then refused to provide slides to interested reporters.

Since then, IBM’s media-relations specialists (but more importantly, the executives who call the shots) have learned. If you want to be covered in the newspapers every week, you need to make news every week. Thus, we’re seeing a constant dribbling of OS/2-related announcements. If you read *InfoWorld* or *PC Week*, you’ll see that the strategy’s working.

This month’s dribbles are fairly interesting: Lotus Notes Mail will be the Merlin e-mail client. Merlin itself went into beta testing (*OS/2 Magazine’s* beta arrived the week of June 17th). IBM has demonstrated cluster-

ing on OS/2 Warp Server, and the Directory and Security Server (DSS) is being gamma tested (at deadline).

## A closer look

Ultimail Lite is history, and Lotus Notes Mail 4.0 will be the Internet e-mail client included with Merlin. This release of Notes Mail will not only work with Merlin’s integrated speech engine, but it’ll also work with POP3 mail servers and will support MIME binary attachments to mail messages.

One feature I’m eagerly anticipating is mailbox replication, which will synchronize in-boxes between those messages living on the mail server and others stored locally on a laptop. The lack of such replication drives me nuts when I switch from regular cc:Mail for OS/2 on my desktop to cc:Mail Mobile on my laptop (yes, the Windows version, since Lotus hasn’t released an OS/2 version). I’ll be happy to stop using the cc:Mail client.

But the bigger story is Merlin itself. IBM’s Personal Software Products team began sending out Merlin beta CD-ROMs the week of June 17th; our report on how well it works will appear next month. This first beta program, which will reach 10,000 OS/2 Warp users, should uncover many compatibility flaws in the product; don’t be dismayed if you hear about problems. It’s the problems that *aren’t* unearthed by the beta that we need to worry about!

This first beta appears fairly complete, with voice recognition and Java support both included. Also in the beta is support for many Win32 APIs, under a program sometimes called the Developer API Extensions, sometimes called DAX, sometimes called DAPIE

(IBM’s lawyers kept changing their mind), and finally named Open32. (I guess IBM defines “open” as supporting Microsoft’s proprietary architecture). Open32 allows for faster porting of 32-bit Windows programs to OS/2. Merlin will not run native Win32 programs compiled for Windows 95 or Windows NT; software developers still need to recompile the application for OS/2. But Open32 should make it easier for IBM’s OS/2 evangelists to persuade Windows developers to create OS/2 software. (For more information, see “The Developer API Extensions,” February 1996, p. 34.)

## Serving up news

The phrase “server clustering” evolved in the minicomputer era, and it now means using spare servers to guarantee high-availability of business-critical PC servers. At PC Expo (June 18, New York), IBM was showing a two-server cluster, where each server on the network is paired with another server; if one crashes, the other picks up the load. Clustering is important because it keeps your data network running with the minimum delay. This is still just a demonstration, however; it’s not known when IBM will ship an OS/2 Warp Server cluster solution.

Next stop is the long-awaited DSS server, one of the IBM Software Server solutions still generally referred to by the code-name Project Eagle. After beta testing, of course, comes the poorly defined gamma testing; that’s the phase that DSS for OS/2 Warp Server entered in late June. Directory and Security Services is a way of integrating an enterprise’s many local networks into one easily managed net-



work, with a simplified way of organizing workgroups, geographic locations, resources, user names, and permissions. It seems like the DSS server has been talked about forever. According to IBM, it should be finished by the time you read this news column. (For more information, check out "The Network Connection," March 1996, p. 76.)

## OS/2 BBS bonanza

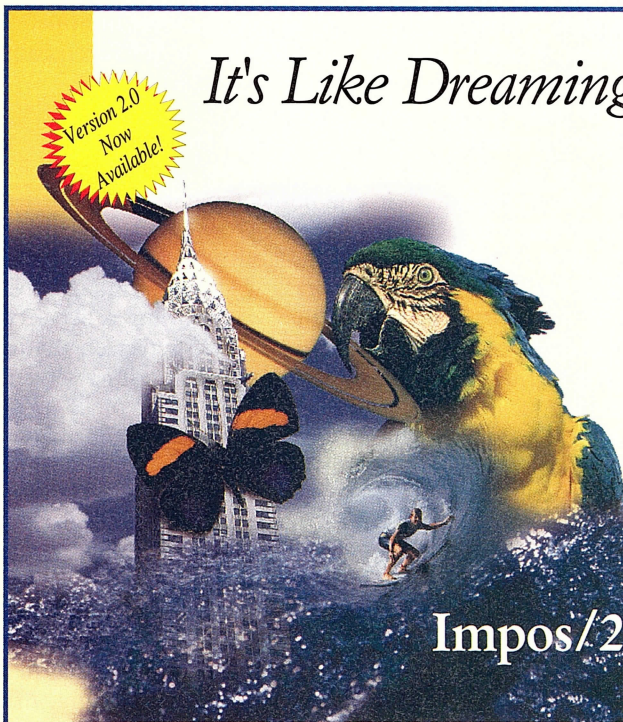
Have modem, will dial? Many OS/2 users are familiar with Pete Norloff's OS/2 Shareware BBS. For many of us, it's an essential resource and the home of more than 30GB of OS/2 applications and utilities.

On June 11th, the OS/2 BBS received its millionth call—in itself not that amazing, until you hear that the BBS receives more than 1,000 calls a day. If you're looking for an OS/2 software bonanza, you can reach the BBS at (703) 385-4325 using a 28.8kbps modem, via the Internet at <http://www.os2bbs.com>, or using telnet at <telnet://bbs.os2bbs.com>. **OS/2**

## OS/2 APPLICATIONS TOP 15 LIST—JUNE 1996

| This Month's Rank | Last Month's Rank | Product                               | Company                  |
|-------------------|-------------------|---------------------------------------|--------------------------|
| 1                 | -                 | Impos2 2.0                            | Compart                  |
| 2                 | 2                 | Hobbes CDROM Archive                  | Walnut Creek CDROM       |
| 3                 | 3                 | Partition Magic 2 Personal Edition    | PowerQuest               |
| 4                 | 4                 | BackMaster 2.0                        | MSR Development          |
| 5                 | 13                | Back Again/2 4.0 Professional Edition | Computer Data Strategies |
| 6                 | 5                 | System Commander 2.2                  | V Communications         |
| 7                 | 1                 | Object Desktop 1.5                    | Stardock Systems         |
| 8                 | 10                | GammaTech Utilities                   | SofTouch Systems         |
| 9                 | 6                 | DeScribe Voyager CD                   | DeScribe                 |
| 10                | -                 | FaxWorks Pro 2.0 Upgrade              | Global Village           |
| 11                | 8                 | UniMaint 4.0                          | SofTouch Systems         |
| 12                | 11                | SimCity 2000 for OS/2                 | Maxis                    |
| 13                | 7                 | IBM AntiVirus 2.4                     | IBM                      |
| 14                | 9                 | Galactic Civilizations 2.0            | Stardock Systems         |
| 15                | 15                | KopyKat 1.2                           | Hilgraeve                |

Since OS/2 Warp and OS/2 Warp Connect are consistently ranked as top-selling products, and sales of additional licenses can sometimes skew results, this list has been modified to highlight only the top-selling OS/2 applications. (Best-seller information courtesy of Indelible Blue.)



## It's Like Dreaming With Your Computer

They say a picture is worth a thousand words, but what words are your pictures saying?

Impos/2, the ultimate 32-bit image processing application for OS/2®, gives you the creative confidence to launch into the fascinating world of electronic image processing.

Take images and manipulate them every way imaginable. Impos/2 even lets you work on several views of one image at the same time!

An extensive choice of tools such as magic wand, rectangular, circular and freehand selections make it easy for you to handle complex image selections, and to do a little dreaming.



Available Through Indelible Blue 1-800-776-8284  
or <http://www.indelible-blue.com/ib>

OS/2 is a registered trademarks of IBM Corporation. All other registered trademarks belong to their respective owners. This ad designed at Indelible Blue on a PC running fast and crash-free under OS/2 Warp.



**Outfitters For The Information Frontier**



Unite CD•Maker is a complete software package for creating your own custom audio and data CDs. CD recordable disks can hold in excess of 650 MB of data or 74 minutes of music and are readable by virtually any PC with a CD-ROM drive. With Unite CD•Maker, you can simply and easily create custom audio CDs by combining songs from several CDs onto one CD. You can create CD-ROMs for backup, archiving, and distribution of personal computer data.

## TARGET APPLICATIONS

- Create your own audio CDs
- Perform periodic backups
- Perform long term data archive
- Distribute large applications or databases
- Facilitate CD reproduction

Includes simple, elegant user interface

## FEATURES

Supports all of these formats:

- Digital Audio
- ISO 9660 Level 1 and 2
- XA Form 1
- Multisession
- Mixed mode
- Enhanced CD

Copies from existing CDs

Includes 32-bit APIs that can be accessed through IBM's VisualAge and C/C++

Performs pre-write tests

Supports burning "on the fly"

Makes the writer a reader, too

## SUPPORTED DEVELOPMENT ENVIRONMENTS

• Hewlett Packard

• Kodak

• Philips

• Pinnacle

• Pioneer

• Plasmon

• Ricoh

• Smart and Friendly

• Sony

• Yamaha

Cirrus Technology is constantly updating its vendor list. Please contact us for a current list of other supported CD-recordable vendors.

• IBM VisualAge

• C/C++

## SUPPORTED CD-RECORDER VENDORS

## OTHER PRODUCTS AVAILABLE

- UniteLite™
- UniteScan™
- Unite Image Viewer/Scanner Object™
- Unite Storer™
- Unite openPage™ (OpenDoc™ enabled)

<http://www.cirunite.com>

Cirrus Technology, Inc. Fourth Floor, 5301 Buckeystown Pike, Frederick, Maryland 21704  
email: 102404.3643@compuserve.com telephone: 1-301-698-1900



# Just Announced

## ReelTime

### OS/2 and MPEG no longer mutually exclusive

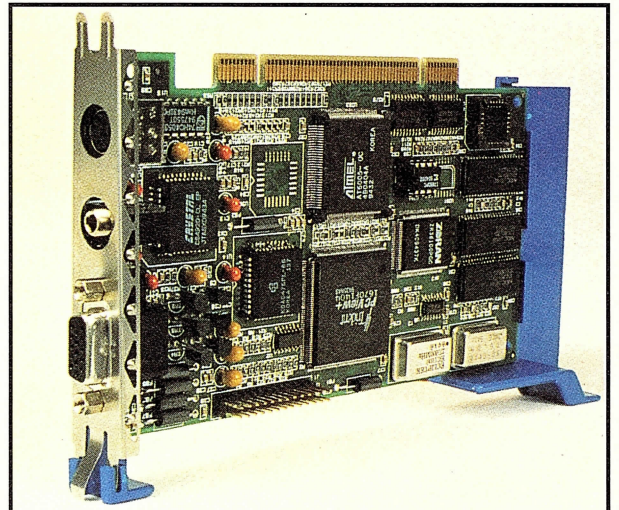
**V**isual Circuits Corp. has released two MPEG add-in solutions that include OS/2 drivers in addition to the standard Windows driver capability.

ReelTime/M is a half-size Microchannel add-in board that provides 24-bit true-color playback at 30 frames per second in a scalable window. It includes CD-quality audio, is OLE-compliant, and compatible with Video CD. Developer support tools are available for custom applications. Drivers include OS/2, DOS, Windows 3.1, and Windows 95. ReelTime/M is list priced at \$495.

Functionally similar to the ReelTime/M, ReelTime/I is a half-size add-in board designed for the ISA bus architecture. Drivers include OS/2, DOS, Windows 3.1, and Windows 95. The list price of the ReelTime/I is \$395.

Visual Circuits Corp., (612) 781-2186, fax (612) 789-6905, e-mail [ltanis@vcircuits.com](mailto:ltanis@vcircuits.com), or see its Web page at <http://www.vcircuits.com>.

READER SERVICE NO. 105



## DBRunner 2.0

### DB2 for OS/2 2.0 support added to migration tool

**P**latinum Technology Inc. announces the availability of DBRunner 2.0, a GUI-based migration tool that automates the time-consuming task of keeping DB2 for OS/2 databases consistent across an enterprise.

DBRunner 2.0 supports DB2 for OS/2 2.0. It is able to perform comparisons between a source database and one or more target databases simultaneously. Additional features include: reviewing, modifying, and approving changes before they are applied; performing migrations between DB2 for OS/2 and DB2 for AIX; and new migration commands that provide administrators and developers with enhanced control and flexibility when migrating database objects.

DBRunner performs migrations by changing DB2 for OS/2 database information into script files that can be universally read and exported to other DB2 for OS/2 databases. DB-

Runner automatically processes these script files at the target databases, making any necessary changes to objects in each of the databases. Contact the company for pricing.

Platinum Technology Inc., (800) 442-6861, (708) 620-5000, e-mail [info@platinum.com](mailto:info@platinum.com); or see its Web page at <http://www.platinum.com>.

READER SERVICE NO. 106

## MicroStation

### Engineering design under OS/2

**B**entley Systems Inc. is now shipping MicroStation 95, the newest version of its flagship product, for OS/2 Warp. MicroStation 95 is a 2D/3D CAD product for drafting, design, visualization, analysis, modeling, and database management that allows users on all platforms to work together and seamlessly share project data, custom workspaces, and third-party applications.

Upgrades to MicroStation 95 are included at no additional cost to subscribers of Bentley Select, the compa-

ny's support and licensing program. The upgrade is available to other commercial MicroStation registered users for \$895. For new users, MicroStation 95 is priced at \$3,995. The complete MicroStation 95 kit contains a copy of MicroStation 95 and a copy of MicroStation 5 for organizations that require the previous version.

Bentley Systems Inc., (800) BENTLEY, (610) 458-5000, e-mail at [jen.mcwilliams@bentley.com](mailto:jen.mcwilliams@bentley.com), or see its Web page at <http://www.bentley.com/>.

READER SERVICE NO. 107

## Seagate Sytos Premium 2.2

### Low-cost backup software

**S**eagate Software, Storage Management Group (SMG) has released its Sytos Premium backup and disaster-recovery solution for single OS/2 servers. The product has been updated for easier use with IBM NetView and to facilitate centralized monitoring. In addition, the Sytos Premium autoloader



option now offers automated cartridge support for the Exabyte 210.

Seagate Sytos Premium is designed for OS/2 administrators who require a GUI-based, single-server backup solution. The OS/2-compatible software supports long file names, extended attributes, and full HPFS. The program also has expanded SCSI device support, which allows it to work with existing hardware. Its disaster-recovery feature is designed to restore a server in less than 10 minutes.

Seagate Sytos Premium 2.2 is available at an MSRP of \$299. For a limited time, the new version will be free to current Sytos Premium SCSI desktop and server users.

Seagate Software, (800) 327-2232, (407) 333-7500, fax (407) 333-7730, or see its Web page at <http://www.smg.seagate.com>.

READER SERVICE NO. 108

## RightFax 4.5

### New generation of fax server software

**R**ightFAX Inc. has introduced a new generation of high-end fax server software. RightFAX 4.5 for OS/2 provides streamlined Novell NetWare connections, along with seamless integration with telephony applications and improved fax sending, receiving, and routing techniques.

RightFAX also announced that its fax server technology will be incorporated into Applied Voice Technology's (AVT) CallXpress3 unified messaging software. The integration of these two products provides telephony environments and existing CallXpress3 users with a fax server to handle all incoming and outgoing faxes. It also provides existing RightFAX customers entry into the telephony market. All incoming faxes, e-mail, and voice mail messages can be routed to users' existing CallXpress mailbox via their direct phone extensions. Users will be able to retrieve all voice, fax, and e-

mail messages from either their desktop GUIs or telephone systems.

RightFAX OS/2 4.5 costs \$995 (server license for a single channel, unlimited users) and \$795 for each additional channel.

RightFAX Inc., (520) 327-1357 or fax (520) 321-7456.

READER SERVICE NO. 109

## Pmcomm 2.40

### Built-in telnet and FTP

**M**ulti-Net Communications has updated its OS/2 GUI communications program, Pmcomm. Pmcomm's main new feature is the built-in support for telnet and FTP. Users connect to telnet hosts using the same dialing directory that is used to connect to hosts by modem. Other new features include save/restore scroll buffers, new file transfer dialog box, and multimedia. List price is \$99.95. For those who purchased Pmcomm within the last year, upgrades are free.

Multi-Net Communications, (541) 883-8099, fax (541) 883-7879, e-mail [sales@multinet.com](mailto:sales@multinet.com), or see its Web page at <http://www.multinet.com/mnc>.

READER SERVICE NO. 110

## Business Software Solutions

### CD-ROM offers 30+ native OS/2 Warp applications

**I**BM Corp. has partnered with 20 solution developers to create a CD-ROM that features a complete set of OS/2 Warp applications for business. Business Software Solutions for OS/2 Warp contains marketing information, benefits, screen shots, and demos of native 32-bit applications that exploit OS/2 Warp's unique operating environment. Product categories include spreadsheets, presentations, communications, contact management, reference, document management, groupware, graphics, OCR, utilities, decision support, word processing, time management, and others.

The CD-ROM will be distributed free of charge at selected trade shows, but anyone in the U.S. can order this CD by calling (800) 627-8363 and asking for the OS/2 Warp operator, or by sending e-mail to [sdline@vnet.ibm.com](mailto:sdline@vnet.ibm.com) and requesting the Business Software Solutions for OS/2 Warp CD-ROM.

IBM Corp., (800) 627-8363 or e-mail [sdline@vnet.ibm.com](mailto:sdline@vnet.ibm.com). **OS/2**

## Just Announced OS/2 Internet Sites

### Enhanced Software's OS/2 Links Page

<http://www.neosoft.com/~mred/os2links.html>

Contains links to many categories such as General, Games, Merlin, Internet, and more.

### J3's On-Line OS/2 Store

<http://www.os2store.com/>

Need OS/2 software? Here's another site where you can buy it from friendly OS/2-loving folks.

### Eddie Shultz's OS/2 Sight

<http://www.execpc.com/~eddie>

Graphically links to programs for the Internet, shareware, device drivers, Java applets, and more.

### UPDATED:

Kevin Linfield's Favorite OS/2 Freeware List is at <http://www.haligonian.com/os2/list.html>.

OS/2 Web is at <http://www.teamos2.org/os2web/>.

(Information courtesy of Vicci Conway, [vicci@ibm.net](mailto:vicci@ibm.net).)

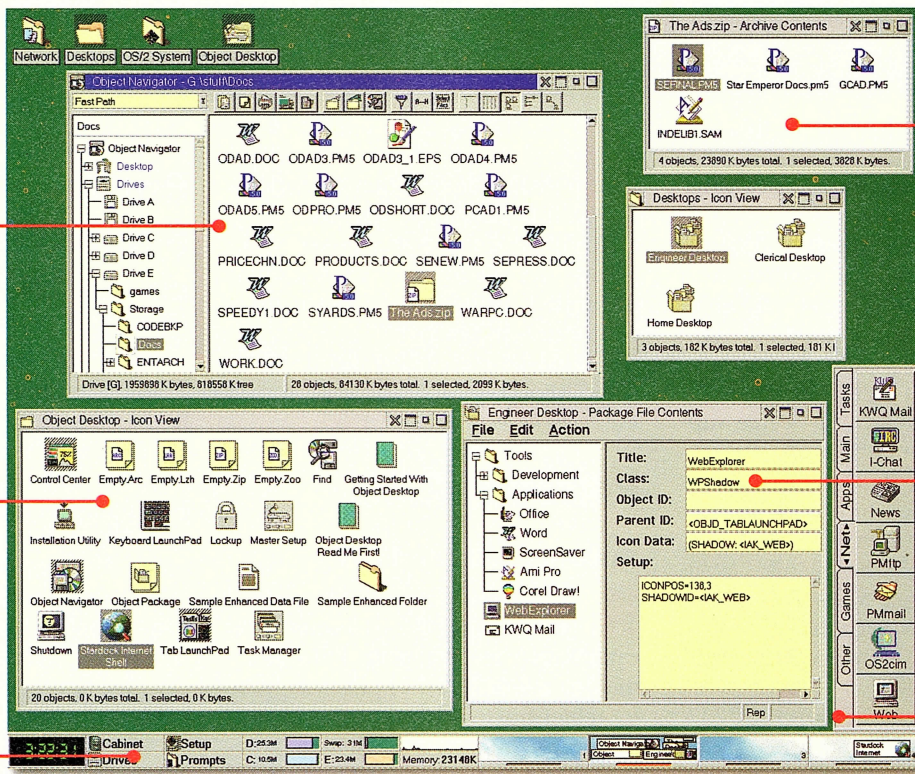


# Have You Upgraded Your OS/2 System Yet?

**Object Navigator**, the first object oriented file manager for OS/2, sees long file names on FAT partitions, shadows, program objects and uses OS/2's native association lists.

**Object Desktop** adds so many requested features to OS/2 that many new users consider it a third party upgrade to the operating system.

The **Control Center** monitors your resources, supplies virtual desktops, and even has cascading folders.



**Object Archives** allows you to work with your ZIP files as if they were standard OS/2 folders. View data and even run programs right from within the archive.

**Object Package** enables users to distribute their objects or entire desktops. It's truly the next generation way to manage your desktop.

The **Tab LaunchPad** allows you to manage your programs. It even keeps track of running programs in the "Tasks" tab

"Object Desktop brings the OS/2 desktop up to its potential and, in doing so, brings it up to date. And it does it so well, I predict it will be an instant hit and best-seller for OS/2 for a long time. No one who sees it will want to do without it."

-InfoWorld.

"Object Desktop makes OS/2 look and feel like a new version."

-PC Magazine

"With the fine reputation Stardock has developed for OS/2 applications, I don't hesitate to recommend Object Desktop fully."

-OS/2 Magazine

"Object Desktop complements OS/2 so well that your immediate response is bound to be, 'That's the way a computer is supposed to work.' If you use OS/2, get Object Desktop. It's simply splendid."

-Computer Shopper

If you want to get the most out of your OS/2 system, you need Object Desktop. It's a powerful yet easy to use desktop environment that leverages the strengths of OS/2 to bring it to a whole new level of power, productivity, and performance.

By working with OS/2 users and IBM over the years, Stardock has created a product that provides the features and functionality that customers have been asking for.

If you or your company is looking for a product that provides the solution to the concerns of the vast majority of problems OS/2 users face every day, chances are, that solution is in Object Desktop.

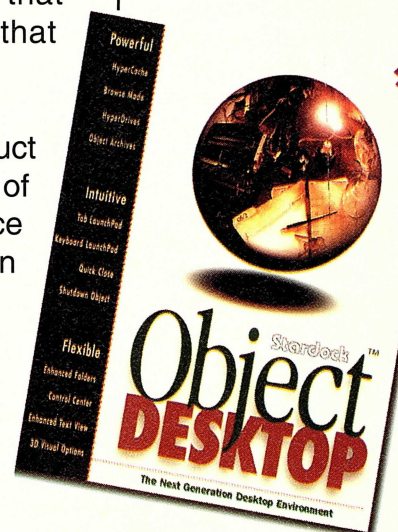
Upgrade your OS/2 system to a new level of power and ease of use. Upgrade to Object Desktop v1.5.

"Object Desktop's power, flexibility, and sheer presence will delight any OS/2 user!"

-PC User

"Object Desktop is the first thing I put onto all my PC's!"

-David Barnes



**Stardock**™ Stardock Systems, Inc.  
Tel: 313-453-0328  
Fax: 313-453-1480  
www.stardock.com

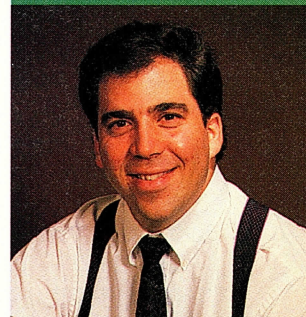
## Introducing Object Desktop v1.5

Upgrade to v1.5: 1-800-672-2338



# os2init, vw32s.sys, Multiple Settings, and More

BY DAVID REICH



TIP 248

## OS2INIT

**Q:** In looking at the *os2.key* file as you suggested in "Archiving Options" (June 1995, pp. 67-70), I found the file *os2init.cmd* listed. I'd never seen one of those. What does that file do?

**A:** *os2init.cmd* is analagous to an *autoexec.bat* file for DOS sessions under OS/2. Think back to the days of DOS. *autoexec.bat* is a file that is run when you first boot a DOS system. You can set it up to do things to initialize your system.

Under OS/2, where you can have many DOS sessions or virtual machines, *autoexec.bat* must run for each session to initialize that session. In fact, you can use the **DOS\_AUTOEXEC** setting to have a different one run for each of the DOS sessions you wish to start. To do that, open the Settings notebook for a DOS session by right-clicking on the icon to bring up the context menu, and select Settings. Click on the Session tab, and select the DOS Settings pushbutton. Confirm that you want to see all of the settings, and click to highlight **DOS\_AUTOEXEC**. From there, you can click on the entry field and type a path and file name for the *.bat* file you wish to use as an **AUTOEXEC** for that DOS session.

Back to the original question, *os2init.cmd* was designed for the same purpose as **AUTOEXEC**, only for OS/2 command prompt sessions. It has been a while since I used *os2init.cmd*, so thanks are due to Aidon Jennery of

IBM who helped restore my memory.

One might just create *os2init.cmd* and expect it to work. That is just the first part. You will also need to modify your *config.sys* file to point to *os2init.cmd* for command prompt sessions. In *config.sys*, look for the line

```
SET OS2_SHELL=C:\OS2\CMD.EXE
```

You may have something other than C: if you installed OS/2 on another drive. Modify the line to read

```
SET OS2_SHELL=C:\OS2\CMD.EXE |  
/K C:\OS2INIT.CMD
```

where C:\os2init.cmd is the path and file name to tell the system where to find *os2init.cmd*. In fact, you don't even have to call it *os2init.cmd*; you can name it anything you like.

This tells the system that *cmd.exe* is

the OS/2 Command Prompt processor, and that when it starts, to pass C:\os2init.cmd to it (which will cause it to be run). The /K says to keep the session active after the program runs.

TIP 249

## VW32S.SYS

**Q:** What is the purpose of the *vw32s.sys* in the OS/2 *config.sys* file? I recently acquired the demo Ice&Fire, which uses Win32S. When I tried to run it, I was confronted with "WIN-32S Error" and "One or more system components is of the older version. Re-Install." I find myself with a lot of demos that use some sort of Win32 and WinG and other new games for Windows 95. Will running these types

## Downloading HTMLs

Clay Little sent in a suggestion based on my answer to the "Dragging the Web" question (Tip 236, June 1996, pp. 20-22). For downloading HTMLs, with all of the graphics and so on, for later viewing, he suggests you change the status of the printer queue to hold, then print all Web pages you are interested in. After you disconnect from your service, you can view each page waiting in the queue. The format of the files in the print queue make them difficult to change and will use more disk space than if you just had the HTML (because now they are graphics files), but this works for capturing HTMLs and viewing them later.

Another reader, John Blumel, pointed me to a *.zip* file on Hobbes that would be able to get a file based on a URL. I haven't looked into it yet, but I'll provide the reference to the file here and let you play with it while I do. (Feedback on how useful you find the *.zip* file is welcome.) The program on Hobbes can be found at: <ftp://hobbes.nmsu.edu/os2/network/tcpip/geturl.zip>.

It may be possible to use this file, along with REXX, to do some parsing and have a program that is linkable in the WebExplorer to download complete HTMLs with the associated graphics for later viewing.



of games on the OS/2 platform be a problem?

**A:** Microsoft Corp. has written a subset of the Win32 (32-bit Windows) application programming interfaces into a library that it allows software vendors to ship with applications. Microsoft also ships this Win32S (Win32 Subset) with some of its products.

Since its initial release, Win32S has undergone many changes. Software developers have faced challenges in keeping up with the changes, in deciding whether to exploit the newest version, and in helping users keep the right versions on their systems to run the applications.

IBM has written an extension to OS/2 to allow Win32S applications to run in Windows (WINOS2) sessions under OS/2. `vw32s.sys` is the main file for the OS/2 Win32S support. If your application or WINOS2 says that the file, or Win32S support, is of the wrong version, you need to do some research into what is needed for your specific application.

The current version of Win32S support for OS/2 is 1.25. If your application happens to require a version of Win32S later than to 1.25, you will either have to wait for a further upgrade to OS/2 from IBM or run the application under Windows with a tool such as Dual Boot or Boot Manager.

### TIP 250

## TO FIX OR NOT TO FIX?

**Q:** I read that there is now a FixPak 17 for OS/2 Warp. I do not presently have OS/2 Warp installed on my system, though even when I did, I never installed any of the FixPaks. I do intend to re-install OS/2 Warp. My question is, if I want to install the FixPaks, must I now install all 17 individual FixPaks from 1 to 17? And finally, is there a text file that de-

scribes what each of these FixPaks hopefully corrects—if one exists, where might I read/download it?

**A:** FixPaks are cumulative. That is, each FixPak, unless specifically otherwise documented, contains all of the fixes from all of the FixPaks prior. However, you could go right to OS/2 Warp 4, which contains all of the new features you've heard about in the pre-release referred to as "Merlin," as well as the same fixes from the OS/2 Warp FixPak. Some synchronization issues, of course, will arise between the OS/2 Warp 4 release and the OS/2 Warp 3 FixPaks due to their separate release times, but IBM tries to synch them up as closely as possible.

Each FixPak has a *readme* file that describes all of the APARs (IBM-speak for field-reported bug fixes) fixed in that FixPak. Because the fixes are cumulative unless otherwise documented, the APAR list in the *readme* file is also cumulative.

Now that the direct question is answered, I'll take a moment to offer some of my personal philosophy on applying fixes.

While it is natural in the software business to always want the latest and greatest code, I operate with a different attitude on fixes. Whether it be operating system or application code, my belief is, "If it ain't broke, don't fix it." If you have a specific problem that you know is fixed by a specific APAR, or that you know doesn't exist after FixPak X, then by all means, go for it. However, if you are updating just for the sake of updating, I advise proceeding with caution. **OS/2**

## Multiple Settings Change

*In Tip 211 (February 1996, pp. 16-18), I said that there is no way to modify the settings of multiple instances of an object. While you can't change one object and have it fix a bunch of related objects at the same time, Kevin McCoy has sent in a time-saver that can help.*

An easy way to change settings of multiple object instances is to use the Find Objects tool. Right-click on the desktop and then left-click on Find to get to this tool. Alternatively, you can use the magnifying glass icon on the OS/2 Warp LaunchPad.

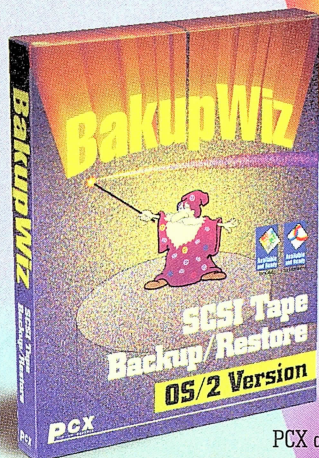
In the Find dialog, type in the name of the object you want to modify in the field labeled Name. If you need to find multiple objects to modify, use wildcards. Make sure the Start Folder is `X:\desktop` (where X is the OS/2 boot drive in which the Desktop directory is located). Make sure the Search All Subfolders checkbox is checked. To start the search, click on the Find button.

The system will open a window with all of the object names in the desktop matching the name or name with wildcards you have specified. Click on a specific name in this Find Results window to make it the focus of your search. You can select them all by clicking and holding the right button while you drag the mouse to select all of the objects. Alternatively, you could hold the `<Ctrl>` key and hit the backslash key, which will also select them all. You can then right-click on one of the selected objects to bring up the Context menu, and then left-click on Settings to open the Settings notebook.

The system will open the Settings notebook for each of the selected icons, one on top of the other. Of course, you will have to change the settings for each object individually and then close each Settings notebook, but this search and select-all technique makes the selection of the objects easier. If they all happen to reside in the same folder anyway, you can avoid the search step of the procedure. Additionally, if you are changing paths or other text-based information, you can cut/copy and paste to insert the text into the other objects and save a few keystrokes.

*David Reich has been with the OS/2 development team since 1987. David is a contributing editor and has written numerous articles on OS/2 and is the author of Designing High-Performance OS/2 Warp Applications, published by John Wiley & Sons. Questions can be addressed to David via CompuServe at 76711,632 and via the Internet at speedracer@austin.ibm.com.*





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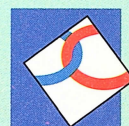
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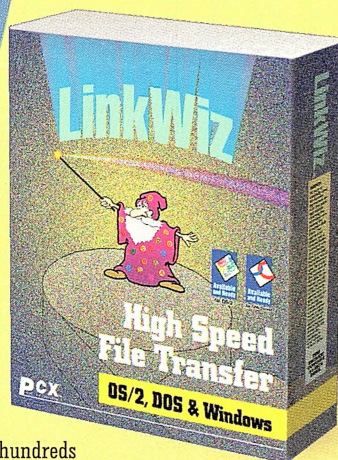
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# Java Meets

# REXX

By Merrill Callaway

NetRexx is the  
hottest new language  
on the Web



**H**ave you heard about the newest measure of time? It's called a "Web Year" and it's equal to about 90 days. Seriously, it's amazing how fast everything related to the Internet is evolving, including those products used to enhance Web pages. And now, even a special version of REXX is available designed to do just that.

There are now three flavors of REXX for OS/2 users, all of which can enhance your Internet activities: the original "classic," text-based REXX that comes with OS/2 Warp and previous versions of OS/2; the new Object REXX (released last May), which should be the standard-issue REXX in the OS/2 Warp "Merlin"; and the new NetRexx, which some call a "dialect" of Object REXX because of its similar syntax.

NetRexx looks much like Object REXX (see "REXX and the Object Paradigm," p. 22), but several important differences exist because NetRexx is intimately associated with Java. NetRexx must match Java's syntactical idiosyncrasies as well as Java's particular object paradigm.

NetRexx is sure to affect Web development in a major way, provided that Sun's Java language continues its phenomenal growth.

### Introducing NetRexx

What is NetRexx for? Briefly, NetRexx writes Java source code easily. The NetRexx translator takes ASCII input (NetRexx source code) and outputs standard Java source code, also in ASCII. The NetRexx output will compile into standard "Java bytecode" via any standard Java compiler that executes (sometimes remotely over a network) on any platform using Java-enabled software (called a "Java run-time environment") to interpret Java bytecodes.

The NetRexx programmer benefits from easy REXX syntax, coupled with the rich set of available Java object classes. Java applets (bytecodes that run on Web pages) may be much more rapidly developed via NetRexx than in straight Java, a fairly difficult language intimately related to C++. (Sun Microsystems developed Java, but IBM licensed Java from Sun and will develop for it widely.)

Why Java? Java has captured the imagination and the development bucks of just about every non-Microsoft company, especially IBM. Even before you read this, IBM will have made the latest OS/2 WebExplorer Java compliant, and a Java run-time environment is to be an integral part of the next version of OS/2 Warp, which IBM refers to as "Merlin."

In a strategic earlier step, IBM's Mike Cowlishaw, an IBM Fellow who developed REXX in the first place, studied Java in detail for six months in 1995. He concluded that Java is powerful, but it needs an easier way to write code (using REXX syntax, of course). He therefore implemented NetRexx in the six months following his Java study. NetRexx debuted on the Web and at the international REXX Language Symposium of Austin, Texas in May 1996.

### Who cares about Java?

Why is Java so important? The World Wide Web provides a common interface to the myriad servers that form the Internet. Before Java, a typical Web browser could access all

sorts of information in various Web pages written in HTML (Hypertext Markup Language), but the interaction between the user (client) and the server was essentially static. The user could not change the page or manipulate anything on the server in real time.

Next came the Common Gateway Interface (CGI). It allowed a limited amount of interaction to occur, such as registering or requesting to be put on a subscription list. CGI has too clumsy a design for complex real-time interaction and will soon be obsolete. (For more technical information on why CGI is not the future, see [http://www2.hursley.ibm.com/goserve/\\$GoSer49.htm](http://www2.hursley.ibm.com/goserve/$GoSer49.htm).)

Java represents the third phase: It enables secure and complex remote interaction in real time over heterogeneous networks. Therefore, Java's distributed computing potential is enormous.

### Differences and difficulties

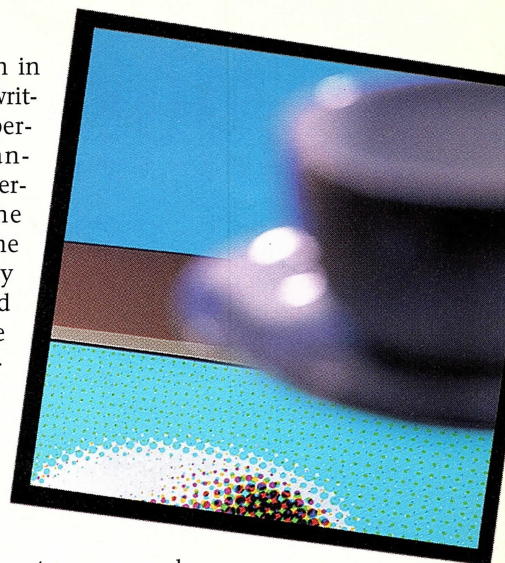
NetRexx improves syntax, thus productivity, several-fold over straight Java coding. However, if you're new to Java development, you can't take advantage of its power until you understand Java objects and how they work, because NetRexx code uses Java objects directly. You will need to get a Java book and learn the conceptual parts, if not the Java syntax.

An important syntactical difference between NetRexx and Object REXX is the use of a dot rather than a twiddle (~) to signify a message to an object from a method (the dot copies Java syntax). Another important difference is that, because Java is a strongly typed language, you can't always expect NetRexx variables to be typed on the fly. When a NetRexx token represents an underlying Java object, it must be initialized. This is easy: Simply set an uninitialized NetRexx variable equal to anything of the correct type.

Beyond the Java capability, NetRexx offers several improvements over Object REXX:

- A double dash (--) may be used to comment out the end of a line. Or you can still use the regular /\* ... \*/ comment tokens. Choose whichever looks neater.
- There's a new **LOOP** instruction, which can replace **DO** for a loop block.
- A **LABEL** statement can occur in the **LOOP** line to define the precise end of the loop (the matching label comes in the **END** statement).

NetRexx is a language in transition, so we won't spend too much time on syntax details. You can download the latest version at any time.





## REXX and the Object Paradigm

**N**etRexx is best understood in terms of its roots in classic and Object REXX. Object REXX is a superset of classic REXX; in Object REXX, all your old code should run without modification. Classic REXX will not become obsolete. In fact, classic REXX became an ANSI Standard language in the spring of 1996.

Although classic REXX code runs fine under the Object REXX interpreter, Object REXX represents a paradigm shift from its predecessor. In classic REXX, everything is a string; in Object REXX, everything is an object. An object contains code (known as methods, which teach the object how to perform its desired functions) and data (variables and attributes).

An object (or a class of objects) presents a uniform interface to the outside world. Modular applications may be built from such objects without worry on the part of the programmer as to what goes on inside the object. Object REXX can be used to make its own objects, or it can use SOM objects, using their classes and attendant methods. Object REXX is the first SOM-enabled scripting language. Object REXX can use objects written in C++ for instance.

Classic REXX programs will run under the Object REXX interpreter (an enhanced version of its predecessor) without incident because strings are simply instances of the string class, and the string functions used by classic REXX have kept their names and the old syntax still works. Object REXX now calls these string functions "methods" and introduces a new messaging syntax involving the "twiddle" (~). (The "old" syntax is in some cases preferable to "pure" object-oriented syntax, such as when performing arithmetic.)

Object REXX can deal with many classes besides strings. IBM began development of Object REXX in the late 1980s, intending to develop a fully object-oriented extension of REXX. The Object REXX interpreter supports a full set of objects, classes, and methods. It supports messaging, polymorphism, inheritance, and multiple inheritance. Object REXX supports inter-object concurrency (multiple objects are active, exchanging messages, synchronizing, and running methods simultaneously). The language also supports intra-object concurrency (multiple methods run on the same object simultaneously). Both forms of concurrency are vital in the client/server environment.

### Java up and running

Ready to start working with NetRexx? You'll need more than the language tool itself. If you're working with a pre-Merlin version of OS/2 Warp, you'll also need to get Java for OS/2 and, if you wish to run Java applets, a Java-enabled WebExplorer.

You can download Java and the Java Development Kit from <http://ncc.hursley.ibm.com/javainfo>. There are four Java files available for download: *runtime.zip*, the run-time environment; *toolkit.zip*, the development environment; *samples.zip*, a collection of sample applets; and *desktop.zip*, which takes care of installing desktop objects.

The Java toolkit (needed for NetRexx) and samples files require an HPFS disk. Because they must be installed on top of the run time, the run time also must be installed onto an HPFS disk, even though FAT is adequate for just the run time alone. The toolkit requires that the run time already be installed. Ignore any warnings from UNZIP about the 'copy-

right' file already existing. To install the Java toolkit, follow these steps:

- If this is a reinstall, save or backup existing directories. Then delete *\javaos2*.
- Register at the IBM Java site, download the four *.zip* files mentioned earlier, and place them in your root directory.
- Unzip *runtime.zip* first; then the others. Make sure to use the **-d** option flag that creates subdirectories if you are not using Info-Zip. This should create a *\javaos2* directory and the following subdirectories:
  - \bin* Java *.exe* files
  - \demo* Demonstration applets, images, audio clips, and more
  - \dll* *dll* files for the Java interpreter and native classes
  - \include* Include files for building native classes
  - \lib* *.lib* files and Java property files and classes *.zip* file.
- Update *config.sys* to make sure the PATH and LIBPATH include:

```
SET PATH=D:\JAVAOS2\BIN;...
LIBPATH=D:\JAVAOS2\DLL;...
```

- Reboot and verify installation. Change to the *javaos2\demo\hello* directory. At a command line type **java hello**—this should interpret bytecodes from the *hello.class* file. Next, type **javac hello.java** to run the Java compiler, so as to compile the file *hello.java* to make *hello.class*. (Many Java command arguments are case-sensitive.)
- Next, type **java hello** again to check the *hello.class* file just built. Remember, Java looks for a class, not a file, so don't specify *.class* on **java**. On the other hand, you'll need to specify the *.java* when using the Java compiler, **javac**.
- To install the desktop, unzip the *desktop.zip* file. Add the *\bin* directory in your PATH, then enter the command **javadskt** and follow instructions (the temporary icons are updated later).

Look inside the *readme.run* and *readme.tlk* files to read more information about the run-time and toolkit packages. Make sure to read the FAQ file at the IBM Java site for other details, too. I also recommend the Corigan Computers Java FAQ at <http://www.teleport.com/~jcorigan/JavaFAQ.shtml>. More information about Java can be had at Sun Microsystems site, at <http://java.sun.com/whitePaper/java-whitepaper-1.html>.

### Finally, NetRexx

NetRexx lives at <http://www2.hursley.ibm.com/netrexx>. Be sure to get version 0.59 or later of NetRexx (dated May 6, 1996). The NetRexx file that you'll download will contain HTML and ASCII documentation, class files (they should work on all Java platforms), and the NetRexx translator. The prototype translator is written in REXX and is in the process of being ported to NetRexx (at which point, it should run on all Java platforms). Meanwhile, on OS/2 it works fine.

Before you begin the installation, you must have *unzip.exe* (Info-Zip 5, dated August 12, 1994) in a directory on your PATH. The NetRexx translator will use this for accessing the Java classes held in the Java Development Kit Zip file *\lib\classes.zip*.



To start, create a NetRexx directory; I called mine *NetRX059*. Then download *nrex.zip* from the Web site into this directory and unzip the file. This will create the *\nrex* directory and leave you with another *.zip* file, *nros2.zip*. Copy this new *.zip* file to your *\javaos2* directory, and make that your current directory.

Next, unzip *nros2.zip*. This file will create the *\javaos2\classes\netrex\lang* directory, which gives NetRexx the classes needed to enable REXX support (in Java jargon, these form the package *netrex.lang.\**). The process also adds *NetRexxC.cmd* (the NetRexx Compiler command), *NetRexxT.exe* (the NetRexx Translator program), *nrc.cmd* (shorter name for NetRexxC), and *hello.nrx* (a simple NetRexx program for testing) to *\javaos2\bin*.

To verify installation, open a command window, change to the *\javaos2\bin* directory, and type **netrexxc hello**. This runs the NetRexx translator, which converts the NetRexx program *hello.nrx* to the Java program *hello.java*. It then invokes the Java compiler to compile *hello.java* to *hello.class*. (The intermediate *.java* file is then deleted.) Next, type **java hello**, to see a simple greeting. If it's there, everything worked!

To save some typing, you can translate, compile, and run it all in one step by typing **nrc -run hello**, which runs a simple REXX script. You can then edit *nrc.cmd* to add default NetRexxC options (keep a backup copy, so that a new version of the NetRexx package will not overwrite your changes).

Finally, you might wish to add *\javaos2\bin* to your *config.sys* PATH statement. This takes care of a present restriction to ensure that *nrc* and NetRexxC will work from anywhere. Also, make sure you have installed *javap.exe* (in the Java Toolkit). Otherwise you will see an error message indicating *javap.missing* (you need both run time and toolkit in a complete Java installation).

## Java meets WebExplorer

The Java-enabled WebExplorer supports Java applets, so you can surf the Web in interactive style. Web-page Java applets can animate graphics and run multimedia applications. Once you register and download the

## Hardware and Software Requirements

To use NetRexx, you'll need a 486 or better, 12MB RAM, and at least 27MB hard disk space formatted HPFS. OS/2 Java, NetRexx, and the Java-enabled WebExplorer all *require* use of long file names. So, if your partition is not HPFS, better get Partition Magic and convert it from FAT!

For software, you can use any version of OS/2 Warp. You'll need either TCP/IP 3.0 (included with OS/2 Warp Connect) or TCP/IP 2.0, with the latest Corrective Service applied and APAR fix PN 71501. You can get the fix from [ftp.ibm.net/pub/pn71501](http://ftp.ibm.net/pub/pn71501) or use Retrieve Software Updates program in your Internet Connection software.

code, go to a page that contains a Java applet. This WebExplorer supports beta applets using an early OS/2 JDK 1.0 Java port (as of May 1996). Applets are identified by the **<applet>** HTML tag. WebExplorer provides no support for the **<app>** (JDK Alpha version) tag or for the **<script>** tag used in JavaScript programs.

The WebExplorer Configure pull-down menu includes user settings for Java to turn Java support off or on. When Java support is off, WebExplorer ignores **<applet>** tags, flushes

the Java cache, and removes any applets that were saved. Another setting opens a Java console window that displays applet-generated information, such as accessed file names and applet status messages. Java applet messages that are running are captured whether the console is open or closed.

If your users are inside a network firewall, they must enable the Web browser to access Java applets through a proxy server. Users can also enable a Socks server to be used



# A T S

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## Interesting REXX Programs for the Internet

From <http://www.shadow.net/~davidjr/tcpip/slipp.html>, you can download *ppdial28.zip*, which is a REXX program that redials your PPP connection when busy. Put this script in the Login Sequence window of your Dial Other Providers settings notebook, page 1.

From <http://www.aescon.com/~innoval> you can look at Surf'nRexx. This is a library of functions to use once your connection is up.

I don't have room to include it here, but if you e-mail me at [callaway@indirect.com](mailto:callaway@indirect.com), I will send you a neat little REXX program to sort your WebExplorer Quicklist by URL name.

for all connections other than Java applets. Users may cache Java applets and set how many to store (as images are treated). Bear in mind that the more cached applets, the slower the performance.

When you install the new WebExplorer, be sure to save your existing *\tcpip\etc\explore.ini* file. It's very important to do so, because the new installation changes this file.

Start by creating the directory *\webjava*. Again, this must be on an HPFS partition. Browse to <http://www.raleigh.ibm.com/WebExplorer> and then go to the Java Technology Demo sec-

tion. Register again, and then download *web60319.zip* (or later) to *\webjava*. Unzip the file, and you'll create a *demo* directory, README files, and several *explore.\** and *install.\** files.

Next, run *install.exe*. Inside the Install window, use the Options check boxes to automatically update your *config.sys*. Inside the Install Directories window, click **Select all** and verify the following default directories:

- WebExplorer Demo files. Install the demo files in a separate directory from your current "regular" copy of WebExplorer.

- Location of Java for OS/2. Directory containing JDK Java implementation for OS/2 Warp (used to update the SET CLASSPATH statement in *config.sys*).

Finally, reboot and verify installation. At a command line (assuming your NetRexx drive is d:) type **explore d:\netrx059\nrex\netrexx.htm**. You should see the Java applet running!

### Running a Java applet

Applets are embedded Java programs in a Web HTML page. Here's how you use them. First, create *myweb.htm*, and in it, embed the lines:

```
<applet code="myprog.class"
width=500 height=500>
</applet>
```

To invoke the Java Applet Viewer, enter either of the following in a command line:

```
applet myweb.htm
applet file:/d:\myjava\
myweb.htm
```

Now, you have the tools and resources to get started in NetRexx. Keep an eye on the newsgroups and Web sites mentioned throughout this article for further developments. **OS/2**

Creating KILLER GRAPHICS Requires...

# KILLER APPS

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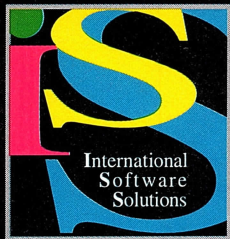
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Merrill Callaway, a former aerospace senior logistics engineer, is the author of two REXX books, *The ARexx Cookbook* (Amiga REXX) and *The REXX Cookbook* (REXX in OS/2), as well as numerous articles about REXX. He is a member of the REXX Language Association, Team OS/2, and the founder of Whitestone, a publishing company for technical books. He can be reached on the Internet at [callaway@indirect.com](mailto:callaway@indirect.com).

Reader Service No. 12





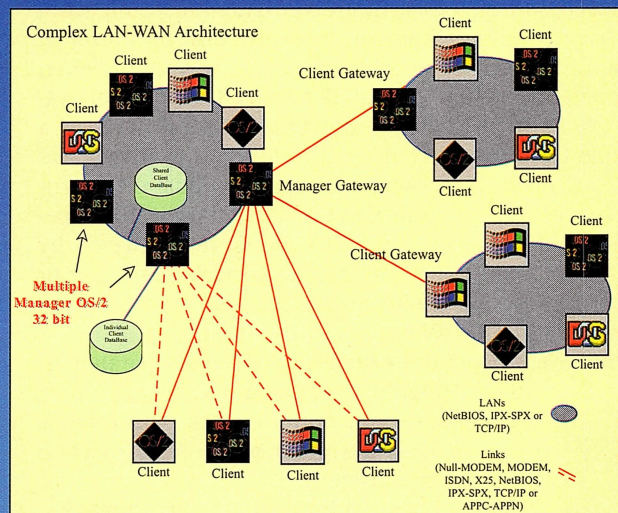
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**OS/2 Professional October 1995**

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**Australian Personal Computer March 96**

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# Giving Operating Systems the Boot

There's more to starting up than just turning on the power switch.

By Lenny Bailes

If you look at a list of best-selling OS/2 software, you may be bemused to discover that one non-OS/2 product consistently appears on the top-ten charts.

System Commander, from V Communications is a multiboot system utility that many users have adopted in place of OS/2's Boot Manager. System Commander is popular for its ability to let users easily install and run multiple operating systems from a single FAT hard disk partition.

Without wanting to deny the virtues of this useful package, our job is to show you that System Commander may be overkill for simple dual-boot (or even triple-boot) configurations. If your goal is simply to make OS/2 co-exist with Windows 95, Windows NT, or a variant of UNIX, you can get plenty of mileage from the pair of boots you already own—OS/2's Boot Manager, plus a little installation savvy is all that you really need to run multiple operating systems from a single hard disk.

## Under the hood

Accessing two or three operating systems through OS/2's Boot Manager may actually be more convenient and

healthier for your hard disk in the long run. The reason is simple: 32-bit versions of Windows have slightly different ways of handling long file names and optimizing the disk structure than OS/2 Warp. If you have Windows 95 or Windows NT co-residing on a single FAT partition with OS/2 Warp or Windows 3.x, you may never be able to successfully optimize the file structure without losing attribute information for one operating system or the other.

Instead, in a single-partition configuration you'll probably have to refrain from running any disk optimizer at all—not to mention the risk of file name corruption when one operating system opens files created in another system. OS/2's Boot Manager minimizes the liabilities of a multiple OS configuration by allowing you to install and boot each operating system from an individual disk partition. In this way, you can also take advantage of the superior HPFS, HPFS-386, and NTFS file systems offered by OS/2 Warp, OS/2 Warp Server, and Windows NT. Any or all of these working environments can also share access to a standard FAT DOS/Windows 3.x partition.

When each operating system resides on a separate partition, it again becomes feasible to do disk maintenance and optimize disk performance with utilities designed separately for each working environment.

OS/2 Warp, Windows NT, Windows 95, and Windows for Workgroups 3.x can all be run from either a primary or an extended hard disk partition on a primary or secondary hard disk. This feature dovetails neatly with OS/2 Boot Manager's ability to create up to three primary operating system partitions on each physical drive. The number of extended partitions is usually limited only by available disk space. The Boot Manager itself occupies a fourth 1MB to 2MB partition on the first physical hard drive in your system.

MS-DOS and PC DOS versions 5 to 6.x (which we'll call DOS), and UNIX variants are operating systems that must be installed in individual primary partitions on the first physical drive. Windows 95 and Windows NT may share a FAT partition with DOS or OS/2 Warp, or (as we've said) be installed to better use in their own primary or extended disk partitions.

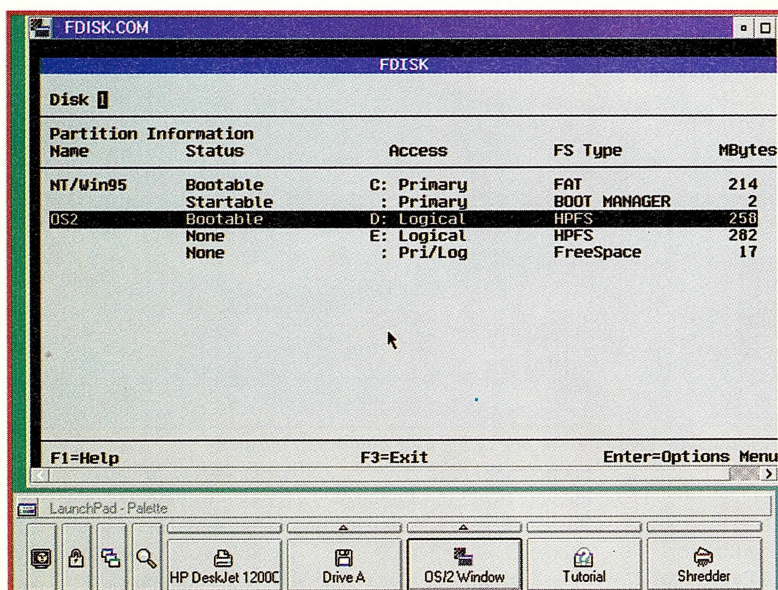


Figure 1: A triple-boot system with Windows 95 on FAT drive C:, along with the Windows NT boot loader, OS/2 on HPFS-386 drive D:, and Windows NT 3.51 Workstation on NTFS drive E:.



OS/2, Windows NT, and Windows 95 all contain support for multiboot operating configurations. To keep these boot options from cancelling each other out, the order of installation of the operating systems can be a critical factor. Although you can configure a dual- or triple-boot system no matter what the order of OS installation, you'll find it much easier if you go with the following suggested flow.

### The easiest scenario

Generally, the most convenient order of installation is: DOS and Windows 3.x first (if included), then Windows 95, followed by Windows NT, and finally OS/2 Warp. The assumption here is that each operating system will be installed in a separate partition, and you will reserve space on the drive for the OS/2 Boot Manager partition.

For an OS/2 and Windows 95 environment (without DOS or Windows 3.x), install Windows 95 first on a primary FAT partition (allow at least 120MB of storage space). Then install OS/2. If you want to access the OS/2 drive from within Windows 95, then create it as a FAT-based drive within an extended partition. The OS/2 drive should be at least 100MB in size for a basic blue-spine OS/2 Warp "with Windows" installation, or from 200MB to 350MB in size for OS/2 Warp Connect or OS/2 Warp Server. (You'll need to install a blue-spine version of OS/2 Warp, OS/2 Warp Connect, or OS/2 Warp Server if you want to run Windows 3.x applications within OS/2.) Be sure to reserve at least 2MB of free space on your hard disk for the creation of an OS/2 Boot Manager partition.

Adding Windows NT 3.51 Workstation or Server to this mix requires an additional 100MB to 250MB of hard disk space, depending upon the individual modules and supporting applications you select. Windows NT can be installed into a FAT, HPFS, or NTFS file system partition. To maintain its compatibility with Windows 95, be sure to select the option that enables NT's own "boot to your previous operating system" feature.

For best results, NT should be installed after Windows 95, but before OS/2. It is possible to install Windows NT after OS/2, however, without disastrous consequences. First, disable Boot Manager as the active partition. Use an appropriate FDISK utility. After your NT has been installed, you can restore Boot Manager (and your ability to start OS/2 Warp) by again running FDISK or the Windows NT Disk Administrator utility. Simply reset Boot Manager as the active partition.

If Windows 95 was the first operating system you installed, then both it and Windows NT will boot from the primary Drive-C FAT partition. Windows 95 and Windows NT may be co-resident on that FAT partition, or you may elect to place NT's physical files on a separate HPFS or NTFS partition. Just be sure that an entry for the drive C: operating system exists on OS/2's Boot Manager menu. To start either Windows NT or Windows 95, select the entry for the drive C: operating system. (You can title it WIN NT/WIN95.) After

you choose this option in OS/2's Boot Manager, you'll see Windows NT's native Boot Menu on the screen. From this menu, you can select either Windows NT or Windows 95.

To start OS/2 Warp, select it on the OS/2 Boot Manager menu instead of the drive C: operating system.

If you want to add another instrument to the arrangement, try using the procedure we've just outlined to select Windows 95 and press the <F8> key when you see the "Starting Windows 95" message. This will bring up a third (Windows 95) Boot Menu that will let you start up a DOS command prompt.

### The kitchen sink scenario

If you're using the OS/2 Warp "for Windows" red-spine version, the method previously outlined may be insufficient for your needs. You may want to integrate a pre-existing copy of Windows 3.x or Windows for Workgroups 3.11 with OS/2 Warp and run Windows 95 or Windows NT from their own partitions.

For mixed DOS, Windows 95/NT, and OS/2 environments, install DOS 6.x and/or Windows 3.x first on a primary FAT partition that will become drive C:. Next, create an extended partition that can contain a drive with at least 100MB of storage space for Windows 95 or Windows NT. If only Windows 95 is to be installed, it can share drive C: with DOS and Windows 3.x or be placed on its own drive D:.

While, in a pinch, you can also force Windows NT to share drive C: with DOS/Windows 3.x or Windows 95, NT will work to its best advantage if you place it in a separate NTFS or HPFS partition.

A third partition for OS/2 should be at least 100MB in size. If you want to access your OS/2 drive under DOS or Windows 95, then create a drive E: in the FAT-extended partition and place OS/2 there. Otherwise, you can simply let OS/2 Warp's installation process create an HPFS partition that will follow Windows 95 or Windows NT on the hard disk. Be sure to allow at least 2MB of free space for the creation of an OS/2 Boot Manager partition.

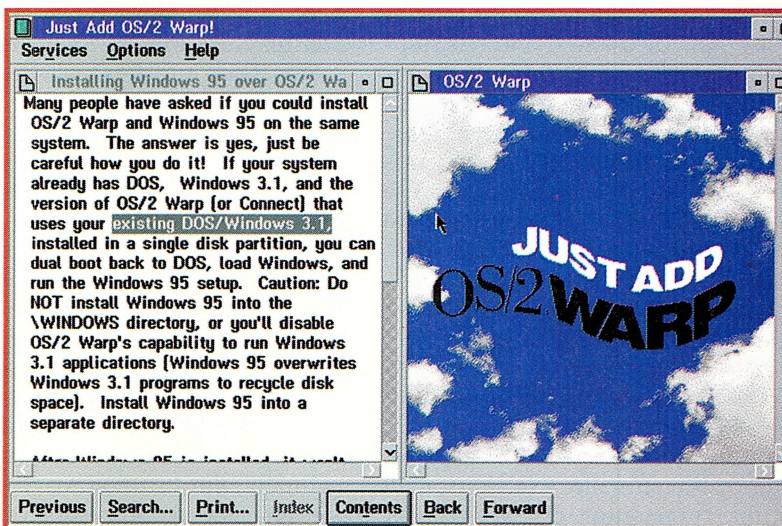


Figure 2: IBM's Just Add OS/2 Warp package includes some useful information files and a pretty OS/2 Warp slideshow, but its bundled migration utilities are unreliable.



## The Notebook User's Best Friend

**P**artition Magic is a utility that spares you from the agony of backing up and restoring all of your hard disk data when it's necessary to change the partition structure. If you have an 800MB single-partition hard disk with 200MB of operating system files already installed, you can use Partition Magic to reduce the size of drive C: to 300MB, freeing the unused 500MB of storage space to create new partitions in FAT, HPFS, NTFS, or other file system formats. Partition Magic 2.0 works equally well at shrinking FAT, HPFS, and HPFS-386 partitions (NTFS volumes can be relocated on the disk, but not resized). Partitions can be moved or resized without losing a single file or configuration option for your currently installed operating system. Partition Magic automatically checks drive integrity and won't operate on the drive from which it is launched; for example, to alter drive C:, you must run Partition Magic from a floppy disk or separate maintenance partition.

To operate on HPFS-386 Partition with Partition Magic, you must first back up and remove the 386 HPFS Access Control Profiles (.acl files). This operation can be accomplished with OS/2 Warp Server's PREPACL utility. PREPACL is located on the first Server Install floppy disk, or in the /cid/server/ibls/ibm500sl directory on the Warp Server installation CD, or in the /ibmlan/netprog directory of the installed Warp Server. The command **A:\PREPACL/P/B:C:\OLDPROFL/D:C** will back up and remove all .acl files on drive C: (/D:C) to a file called OLDPROFL located in the root directory of drive C: (/B:C:\OLDPROFL).

After running Partition Magic to alter the HPFS-386 partition, the command **A:\PREPACL/R/B:C:\OLDPROFL** will restore the .acl files to the disk.

Please note that when you are working on HPFS-386 partitions, you should use only version 2.03 or higher of Partition Magic. Upgrade patches for registered users are available at <http://www.powerquest.com>.

Magic to shrink an OS/2 Warp Server HPFS-386 partition.)

What if Windows NT was there first? If you have an HPFS partition that fills the entire disk, you're out of luck. Until PowerQuest issues a new version of Partition Magic, you'll just have to manually repartition the drive and reinstall all of your operating systems.

If Windows NT is installed on a FAT partition, or your NTFS partition occupies only part of the physical drive, then the current version of Partition Magic will allow you to shrink a FAT partition or move an NTFS partition to make room for new operating systems. To install OS/2, allow sufficient space for an HPFS partition and Boot Manager. Install OS/2 into a newly created HPFS partition and add it (and the original NT partition) to the Boot Manager menu.

### Changing drive letters

Generally, the best thing to do is to locate OS/2 in the last physical partition on the hard disk. This strategy will avoid affecting the original assignment of drive letters. (Whatever you do, don't use Partition Magic to create a new partition ahead of an existing OS/2 partition. This will bump up the OS/2 Warp drive letter and play havoc with OS/2 Warp's system settings.) One system I converted to triple boot was originally configured with a 500MB Windows 95 partition (on drive C:) and a 300MB Windows NT partition (drive D:). I wanted to add OS/2 Warp Server on an HPFS-386 drive and allow this drive to be seen from within Windows NT (which supports the HPFS file system). How did I manage this trick?

Rather than shrink and physically move the existing partitions with Partition Magic, I decided to use it to carve a 300MB chunk out of drive C:, which reduced the Windows 95 partition (on drive C:) to 200MB. I used the free space created in the middle of the disk to install the OS/2 Boot Manager and to create a 298MB HPFS-386 partition for OS/2 Warp Server. To make this drive visible to Windows NT, I told OS/2 FDISK to define it as an extended HPFS partition, rather than a primary partition. I had no trouble doing this and successfully installing OS/2 Warp Server. The OS/2 Boot Manager became the

One issue that we won't deal with in this article is the logistics of installing Windows 95 over an older DOS/Windows 3.x configuration and retaining access to both operating systems before you install OS/2. It can be done. The two operating systems can share a single FAT partition or be placed on separate primary and extended FAT drives. We refer you to your local bookstore for the details.

Once you've mastered this trick, adding OS/2 Warp is easy, as long as you've planned ahead and left sufficient storage space at the end of your hard disk. As we said in the beginning, you'll have a much easier time of it if you install OS/2 Warp in its own FAT or HPFS partition and use Boot Manager. Don't try to make OS/2 Warp dual boot with the operating systems installed on drive C:.

### Finicky power user's scenario

We don't always live in the best of all possible worlds. What if you have a computer where OS/2 Warp has already been installed as the first (and primary) operating system? What if you've just purchased a notebook computer, and it ships with Windows

95 preinstalled on an 800MB drive C:? In these cases, it may be inconvenient or impractical to reformat your hard disk for the easy dual- or triple-boot OS installation. Does this mean that you can't have it all if you want it? No, but setting up the multiboot configuration may require some additional resources and animal cunning.

If OS/2 is installed in a single HPFS partition, Windows NT may be installed directly into the same partition. After Windows NT is installed, you may use the NT Boot Menu to switch back and forth between the two operating systems.

In that same situation, if you wish to add Windows 95, you'll need to create a primary FAT partition on your hard disk. Partition Magic can shrink the HPFS partition, creating space for both a FAT and a Boot Manager partition. Before installing Windows 95, set Boot Manager as the Active Partition and define menu entries for both OS/2 Warp and the "FAT-drive" operating system. To add Windows NT as well, shrink the original HPFS partition with Partition Magic to create sufficient additional storage space. (See "The Notebook User's Best Friend" for details on using Partition



start-up partition, giving me a choice between the "drive C:" operating system (Windows NT/95 Boot Menu) or loading OS/2 Warp from drive D:.

However, placing OS/2 Warp in the middle of the disk disrupted the symbiosis between Windows 95 and Windows NT. The Windows NT boot utility would still start Windows 95 unmo-  
lested on drive C:. But in the original configuration, Windows NT was situated on logical drive D:. Inserting OS/2 Warp changed the drive letter of the Windows NT partition from D: to E:. Selecting the drive C: operating system from Boot Manager would still bring up the Windows NT Boot Menu, but now only Windows 95 would run. Choosing Windows NT from its own Boot Menu produced an error message that stated that the WINNT35 directory could not be found.

My exploration of the Windows NT dual-boot feature soon revealed that there was a file called `c:\boot.ini` that contained the following information:

```
timeout=30
default=multi(0)disk(0)rdisk\
(0)partition(3)\WINNT35
[operating systems]
multi(0)disk(0)rdisk\
(0)partition(3)\WINNT35=J
"Windows NT
Workstation Version 3.51J
multi(0)disk(0)rdisk\
(0)partition(3)\WINNT35=J
"Windows NT
Workstation Version 3.51
C:\ = "Microsoft Windows"
```

Aha! `c:\boot.ini` was the configuration file that told Windows NT where to find its files. But how could I alter it to let the system know that NT was now on drive E: instead of drive D:? After pouring through 50 pounds of documentation from Microsoft, I found no information on the meaning of the `boot.ini` parameters. Finally, a call to a Microsoft support engineer yielded the solution. (See Article Q1028736: `boot.ini` and Arc Path Naming Conventions, which can be found in the Microsoft Knowledge Base at <http://www.microsoft.com>.)

The nomenclature included in Windows NT's `boot.ini` file follows the Advanced RISC Naming Convention. The **multi** parameter is used for IDE drives. (For details on setting up SCSI

drives, see the Microsoft article referred to previously.) The **multi** and **disk** parameters remain 0 and the **rdisk** parameter represents the physical drive designation on the adapter. The **partition** parameter was the key to solving my problem. By editing `boot.ini` and bumping the default **partition** value from 3 to 5 in each occurrence, I was able to reactivate Windows NT Workstation. Windows NT assigns a numerical value to each primary and extended partition on the drive, starting with "1." Primary partitions precede extended partitions on the numbering scheme.

We hope this article has relieved some of the frustration that OS/2 users experience in installing multiple operating systems. With these new boot tips (and a little bit of soul), you may amaze your friends and colleagues with your fancy PC footwork. **OS/2**

## Just Add OS/2 Warp and System Commander

Several months ago, IBM publicized and distributed an in-house utility called Just Add OS/2 Warp. This utility was designed specifically to encourage Windows 95 users to add OS/2 Warp to their computers. In addition to some useful tips and tricks and a demonstration slideshow of OS/2 Warp, the package included a program specifically designed to migrate Windows 95 long file names to the OS/2 environment and a special "Dual Boot" utility, designed to let users automatically switch between Windows 95 and OS/2 Warp simply by clicking a desktop icon.

IBM should have quit when they were ahead with the slideshow and hypertext information files. The long file name migration program and Dual Boot utility are both disasters. In the original version, the migration program didn't work at all. A patched version of this utility released a month later was still buggy, requiring manual user intervention to perform as advertised. Even if you succeed in forcing this conversion to work, it's a one-way street. If you rename any long file name for an object under OS/2 Warp, you destroy the long file name association for the object under Windows 95. I found the Dual Boot utility to be buggy in an all-FAT environment and useless if OS/2 Warp is installed in an HPFS partition.

System Commander is a slightly different story. By creating separate directories that contain the system kernel and start-up files for each operating system, multiple operating systems are installed in a single partition without overwriting each another. Each time you install a new OS on drive C:, System Commander automatically records it and adds a new option to its boot menu. But as seductive as this scenario may seem, some pitfalls still loom. System Commander won't resolve the problems inherent in the different long file name conventions for OS/2 Warp and Windows. And, as we've already mentioned, you would be unwise to attempt disk optimization or disk repair.

A multiple-partition system is ultimately much more flexible, allowing you to optimize and repair each drive with utilities native to the operating environment that the drive contains. If your goal is to test and use more than six operating systems on one computer (Merlin, Windows NT 4.0, Nashville, Linux, coexisting with OS/2 Warp Server, Windows 95, DOS, Windows 3.1, and so on), then System Commander may prove to be a valuable tool, because it can be used in multiple-partition environments, as well as single-drive configurations. But unless that's the route you really need to go, you'll find that good ole' OS/2 Boot Manager will do the trick.

*Lenny Bailes is a technology writer based in San Francisco, Calif. You can contact him 70713.562@compuserve.com.*

### Resources:

#### Partition Magic 2.01 (\$69.95)

PowerQuest Corp.  
(801) 226-8977  
Fax (801) 226-8941  
CompuServe 74601,354  
E-mail [support@powerquest.com](mailto:support@powerquest.com)  
WWW <http://www.powerquest.com>  
READER SERVICE NO. 103

#### System Commander (\$99.95)

V Communications Inc.  
(408) 296-4224  
Fax (408) 296-4441  
WWW <http://www.v-com.com>  
READER SERVICE NO. 104



# Better Graphics Through DIVE

Enhancing the performance of native OS/2 games and multimedia.

By David A. Braun

In the early days of personal computing, most graphics applications and games achieved desired performance levels by writing directly to video memory. That approach may have worked in a single-platform, single-task world where one program owned the entire system, but it certainly won't work in today's GUI environments.

In traditional GUI programming, all of the graphics are drawn in a safe, controlled manner through an interface such as OS/2's Graphical Programming Interface (GPI). A great deal of overhead is involved because the GUI must determine which windows may be overlapping, in what format the screen buffer is stored, and whether or not an image must be scaled each time the program requests that an image be drawn. This overhead results in a loss of speed, making it entirely impractical to even approach 30 frames per second using a GPI. A solution is needed that combines the advantages of a high-level programming interface with direct video control.

Welcome to the Direct Interface to Video Extensions (DIVE). DIVE is a subsystem that allows applications to directly access screen memory to gain an impressive increase in performance. In its simplest form, DIVE provides a pointer to the screen buffer and information about how the screen buffer is formatted. This information alone is not very useful—unless you enjoy the pain of calculating window-blocking areas, color conversions, and scales—so these tasks are handled by OS/2 Warp's DIVE subsystem.

## How does DIVE work?

DIVE uses a memory buffer to allow you to draw graphics in any manner you choose. The buffer can be of any color, depth, or size, and DIVE converts and scales the data when asked to draw to the screen (**blit**). The reason DIVE is so much faster than GPI lies in its implementation of the **DiveSetupBlitter** function. DIVE applications call this function every time the visible region of the window changes. The function, in turn, creates code that draws the buffer to the screen, taking the burden of visi-

ble region-checking away from the **blit** call and updating the screen area far more rapidly.

Before you can use DIVE in your applications you'll need the header files and libraries that IBM has created for using it; these are included with IBM's VisualAge C/C++. If you use another compiler, you'll want to subscribe to IBM's Developer Connection to get the necessary files for programming DIVE applications.

The first thing a DIVE application should do is verify the presence of DIVE support by calling the **DiveQueryCaps** function (Listing 1). This function returns information about the system's DIVE video support or returns an

## DIVE Limitations

DIVE is suited for rapidly copying the same rectangular area to the screen repeatedly. However, the subsystem does not support drawing a portion of a buffer. This may be its greatest limitation. If you want to move a few sprites around a window quickly, without changing the remainder of the window's contents, DIVE is not the way to go. However, if you have a constantly changing buffer, such as in video playback or in a first-person perspective game, DIVE can help to a great extent.

DIVE is not an all-purpose replacement for GPI. Each instance of DIVE requires a substantial amount of memory—for storing the memory buffer and the code that DIVE writes when you call **DiveSetupBlitter** and **blit** to the screen. While you can define several regions of your window as separate instances, this method can consume a great deal of memory if overused.

The second greatest limitation of DIVE lies in its simplicity. DIVE does not provide routines to draw lines, boxes, or any other primitives that are in the GPI. Using DIVE is comparable to DOS programming; you have to write your own graphics library for drawing sprites, moving images, and other graphical functions. Some programmers like this type of direct control and will see it as an advantage. DIVE allows you to gain an additional edge on performance, but at the same time requires additional work and a knowledge of assembly language for maximum performance.



error if DIVE is not supported. Generally, DIVE is not supported in 16-color video modes or on 8514/A video cards. In our sample code, I chose not to use DIVE in less than 8-bit graphics modes, even if the system supports them, because they are not adequate for reasonable display of graphics.

## Initializing an instance of DIVE

Once DIVE support is established, you need to create an instance of DIVE to access the screen. The approach I have taken here is to create a DIVE class, which simplifies its usage in the main application. An advantage is that you can easily create several instances of the class to draw to different parts of your application's windows. My constructor takes the file name of a targa file (a simple image format) and loads that image into the DIVE buffer that is created. This example is not necessarily a practical use of DIVE, but should serve to illustrate its use. We'll ignore the intricacies of the targa file format and move on to initializing the instance of DIVE. The method is very simple:

```
HDIVE  *phDiveInst;          // Handle for display engine instance.
BOOL   fNonScreenInstance;  // Using physical display hardware?
PVOID  ppFrameBuffer;       // Linear address of the screen buffer.
ULONG  rc;                  // Return codes.
rc = DiveOpen(phDiveInst, fNonScreenInstance, ppFrameBuffer);
```

In normal usage, we are not interested in the address of the video buffer, so we can pass a 0 as the third parameter.

```
DiveOpen (&H_Dive, FALSE, 0);
```

Now we must create a buffer in which to store image data before "blitting" it to the screen. DIVE supports several buffer types (Figure 1, p. 34), but in our example here, we are only going to deal with the three most common types: 8-bit palettes, 16-bit "565," and 24-bit color. Once we have chosen a format by reading in the targa file's header, we can set up a DIVE buffer to match it. As we go along, we are setting up the **SETUP\_BLITTER** structure (Figure 2, p. 35), so that we will be able to respond to changes in the visible region once the DIVE instance is ready.

## Colors and palettes

There are two calls for dealing with palettes in DIVE. **DiveSetSourcePalette** is only used if your DIVE buffer is 8-bit depth. In that case, the function specifies the color palette for your data. **DiveSetDestinationPalette** is only used when the display you are using is running in 8-bit color mode; it then specifies the palette to which your

### Listing 1: Excerpts from the DIVE object.

```

/*****
/* DIVE Class for Application use -J
   D.A.Braun - February 1996   *
*****/
/*****
/* QueryDive function - used to check if
/* the system supports DIVE
int QueryDive ()
{
    DIVE_CAPS DiveCaps;
    FOURCC fccFormats[100] = {0};
    DiveCaps.pFormatData = fccFormats;
    DiveCaps.ulFormatLength = 120;
    DiveCaps.ulStructLen = sizeof(DIVE_CAPS);
    if ( DiveQueryCaps ( &DiveCaps, DIVE_BUFFER_SCREEN ))
        return FALSE;
    if ( DiveCaps.ulDepth < 8 )
        return FALSE;
    return TRUE;
}

/***** CONSTRUCTOR : Set up DIVE and our Image buffer *****/
/* Loads an image and sets up DIVE with
/* that image
DIVEOBJ::DIVEOBJ (char *fname)
{
    ULONG IMGHAND, IMGACT, IMGCOUNT;
    unsigned char TgaHeader [18];
    RGB2 *sourcepal;
    PBYTE pbBuffer;
    int BitDepth;
    DosOpen (fname, // Open up the image file specified
        &IMGHAND,
        &IMGACT,
        0,
        FILE_NORMAL,
        OPEN_ACTION_OPEN_IF_EXISTS,
        OPEN_SHARE_DENYWRITE |
        OPEN_ACCESS_READONLY |
        OPEN_FLAGS_SEQUENTIAL,
        0);
    // Get image information from the targa
    // header - This supports most uncompressed
    // targas, it's behavior is not predictable
    // if given the wrong type of file.
    DosRead (IMGHAND, TgaHeader, 18, &IMGCOUNT);
    Width = TgaHeader[12] + (TgaHeader[13] << 8);
    Height = TgaHeader[14] + (TgaHeader[15] << 8);
    BitDepth = TgaHeader[16];
    open up a dive instance with the necessary settings
    // Initialize DIVE
    DiveOpen (&H_Dive, FALSE, 0);
    // Setup information for the DIVE blitter
    D_BlitSetup.ulStructLen = sizeof ( SETUP_BLITTER );
    D_BlitSetup.ulSrcWidth = Width;
    D_BlitSetup.ulSrcHeight = Height;
}

```

Cont'd on p. 32



image data must be converted upon blitting. We'll deal with the destination call later, but we must use the source palette call now if the targa we are loading is of 8-bit color depth. Note that none of the DIVE palette calls will affect the system palette. You will need to set the palette yourself using Presentation Manager's usual palette interface if you want images to look their best on 256-color displays. This procedure is another task in itself, and we are not going to go into it here.

## Visible region notification

Once you have an instance of DIVE initialized, you must respond to certain messages that OS/2 sends your application. Two of these involve the visible region of your window: **WM\_VRNENABLED** and **WM\_VRNDISABLED**. Because OS/2 doesn't send these messages to application windows by default, you will first have to request that OS/2 inform your window function of changes in the visible region by calling **WinSetVisibleRegionNotify**.

A **WM\_VRNDISABLED** call is usually immediately followed by a **WM\_VRNENABLED** call, but we're better off just dealing with the messages as IBM intended. **WM\_VRNDISABLED** has the effect of temporarily turning off the blitter; to do this, just call **DiveSetupBlitter** with a 0 where the address of the **SETUP\_BLITTER** structure would normally go.

Responding to the **WM\_VRNENABLED** message is a little trickier. In fact, this step is probably the most complicated part of using DIVE. The code in the **DIVEOBJ\_VRN\_Enable** method is largely taken from IBM's example code on using DIVE. While you will most likely never have to write this code, it is worth reading through a few times to understand how it works in case you want to make any customizations. This code asks OS/2 to provide all of the rectangles that are visible within the DIVE region; it then asks DIVE to write the code it will use to blit the image to the screen. The **SETUP\_BLITTER** structure contains quite a bit of information about the region to which DIVE will draw.

## Listing 1: Cont'd from p. 31.

```
D_BlitSetup.ulSrcPosX = 0;
D_BlitSetup.ulSrcPosY = 0;
D_BlitSetup.fInvert = TRUE;
D_BlitSetup.ulDitherType = 0;
D_BlitSetup.fccDstColorFormat = FOURCC_SCRN;
// Color depth specific setup information and creation of buffer
if (BitDepth == 24) // Color Depth 24, BGR3 format.
{
    D_BlitSetup.fccSrcColorFormat = FOURCC_BGR3;
    DiveAllocImageBuffer (H_Dive,
        &DH_Buffer,
        FOURCC_BGR3,
        D_BlitSetup.ulSrcWidth,
        D_BlitSetup.ulSrcHeight,
        0, 0);
}
else if (BitDepth == 16) // Color Depth 16, R565 format.
{
    D_BlitSetup.fccSrcColorFormat = FOURCC_R565;
    DiveAllocImageBuffer (H_Dive,
        &DH_Buffer,
        FOURCC_R565,
        D_BlitSetup.ulSrcWidth,
        D_BlitSetup.ulSrcHeight,
        0, 0);
}
else { // Color Depth 8, Palette format.
    D_BlitSetup.fccSrcColorFormat = FOURCC_LUT8;
    DiveAllocImageBuffer (H_Dive,
        &DH_Buffer,
        FOURCC_LUT8,
        D_BlitSetup.ulSrcWidth,
        D_BlitSetup.ulSrcHeight,
        0, 0);
}

bDepth = BitDepth/8; // Byte Depth is BitDepth/8.
// If 8bit/palette mode then read in the image palette
if (bDepth == 1)
{
    sourcepal = (RGB2*) malloc (256 * sizeof(RGB2));
    for (int cntr = 0; cntr < 256; cntr++)
    {
        DosRead (IMGHAND, &sourcepal[cntr], 3, &IMGCOUNT);
        sourcepal[cntr].fcOptions = 0;
    }
    DiveSetSourcePalette (H_Dive, 0, 256, (char*)sourcepal);
    free (sourcepal);
}

DiveBeginImageBufferAccess // Open access to the image buffer
(H_Dive, DH_Buffer, &pbBuffer, &Width, &Height);
DosRead // Read in the image data
(IMGHAND, pbBuffer, Width * Height * bDepth, &IMGCOUNT);
DiveEndImageBufferAccess // Close access to the image buffer
(H_Dive, DH_Buffer);
DosClose (IMGHAND); // Close the image file
}

//***** Handler for DIVE Realize Palette *****
/* This tells DIVE that the physical palette may have changed.
void DIVEOBJ::Realize_Palette ()
{ DiveSetDestinationPalette (H_Dive, 0, 256, 0); }
```

Cont'd on p. 33



## Listing 1: Cont'd from p. 32.

```

//***** Handler for DIVE VRN Disable *****
// This disables the DIVE blitter because the draw region is
// currently unknown
void DIVEOBJ::VRN_Disable ()
{ DiveSetupBlitter ( H_Dive, 0 ); }
//***** Handler for DIVE VRN Enable *****
// Much of this function was taken from IBM's demo dive code
// I made some changes to allow the image to be scaled to a
// percentage location in it's parent window - see
// DIVEOBJ::Location function below.
void DIVEOBJ::VRN_Enable (HWND client,HWND frame)
{
    POINTL pointl;
    HPS hps;
    HRGN hrgn;
    RECTL rcls [50];
    RGNRECT rgnCtl;
    SWP swp;
    hps = WinGetPS ( client);
    hrgn = GpiCreateRegion ( hps, 0L, NULL );
    if ( hrgn )
    {
        // NOTE: If mp1 is zero, then this was just a move message.
        // Illustrate the visible region on a WM_VRNENABLE.
        WinQueryVisibleRegion ( client, hrgn );
        rgnCtl.ircStart = 0;
        rgnCtl.crc = 50;
        rgnCtl.ulDirection = RECTDIR_LFRT_TOPBOT;
        // Get the all ORed rectangles
        if ( GpiQueryRegionRects ( hps, hrgn, NULL, &rgnCtl, rcls ) )
        {
            // Now find the window position and size, relative to parent.
            WinQueryWindowPos ( client, &swp );
            // Convert the point to offset from desktop lower left.
            pointl.x = swp.x;
            pointl.y = swp.y;
            WinMapWindowPoints ( frame,
                HWND_DESKTOP, (POINTL*)&pointl, 1 );
            // Tell DIVE about the new settings.
            D_BlitSetup.ulDstWidth = swp.cx * W;
            D_BlitSetup.ulDstHeight = swp.cy * H;
            D_BlitSetup.lDstPosX = swp.cx * X;
            D_BlitSetup.lDstPosY = swp.cy * Y;
            D_BlitSetup.lScreenPosX = pointl.x;
            D_BlitSetup.lScreenPosY = pointl.y;
            D_BlitSetup.ulNumDstRects = rgnCtl.crcReturned;
            D_BlitSetup.pVisDstRects = rcls;
            DiveSetupBlitter ( H_Dive, &D_BlitSetup );
        }
        else DiveSetupBlitter ( H_Dive, 0 );
        GpiDestroyRegion( hps, hrgn );
    }
    WinReleasePS( hps );
}
//***** Set Location of DIVE region *****
// Sets the location of this dive object to be at a certain
// place in the window - values are from 0 (left/bottom) to
// 1 (right/top) - DIVE wants left,bottom,width,height in
// screen coordinates, but I want to think of things as
// left,bottom,right,top percentages so I converted it here.
void DIVEOBJ::Location (float xl,float yb,float xr,float yt)
{ X = xl;
  Y = yb;
  W = xr - xl;
  H = yt - yb;
}

```

**Palette notification**

When the system palette changes, OS/2 sends a **WM\_REALIZEPALETTE** message to all open windows. This message must also be passed along to the DIVE instance by calling **DiveSetDestinationPalette**, otherwise the DIVE region will appear with the incorrect palette. This call can specify a palette, or it can pass a null pointer indicating that DIVE should check the current system palette; this is the method that I used in the example.

**Region size and scaling**

You can draw the region to any area within your application windows. To simplify the task of making the DIVE region automatically resize with the application window, the DIVEOBJ class provides a **Location** function that accepts percentages (as a range of 0 to 1) for the location of the region within the window. To make the region consume the entire area of the client window, just pass **DIVEOBJ::Location (0,0,1,1)**. Because the **DiveSetupBlitter** function will be called any time the window is resized or moved, these values will automatically be used in the **VRN\_Enable** function.

**Accessing the video buffer**

Since DIVE can store its buffers anywhere, either in system or video memory, DIVE must give a pointer to the buffer each time an application wishes to change its contents. Acquiring the pointer once and using it repeatedly is not safe because DIVE can move the buffer at any time. For this purpose, the DIVEOBJ class provides functions to open and close application access to the buffer. You should not attempt to blit the DIVE buffer while it is open for application access.

**DIVE multithreading**

DIVE requires that your application be multithreaded. The DIVE **blit** call cannot be made from the window procedure of a program because OS/2 has a lock on the screen while the window processes its **WM\_PAINT** message. For the sake of organization, I have put all of the



DIVE calls into the secondary draw thread of the demo program (Listing 2). This approach is probably the best because it will prevent your window procedure from becoming overrun with DIVE calls, especially if you are using more than one instance, or if you are using different DIVE regions at different times during the execution of your application.

## Full-Screen DIVE

Full-Screen DIVE is intended to provide an even greater performance advantage than normal DIVE by offering a lower-resolution video mode. However, Full-Screen DIVE, as implemented in the latest beta of IBM's toolkit, is not extremely useful; it attempts to block off the Presentation Manager interface and changes the video mode in which OS/2 is running. Thus, Full-Screen DIVE makes all GPI calls unusable while it is active. No dialogs, menus, or font routines can be used.

Even worse, Full-Screen DIVE disables the mouse cursor, which is

|             |                                    |
|-------------|------------------------------------|
| FOURCC_SCRN | Use screen format.                 |
| FOURCC_GREY | Y8 (greyscale)                     |
| FOURCC_LUT8 | 8-bit palettized                   |
| FOURCC_R565 | RGB 565                            |
| FOURCC_R555 | RGB 555                            |
| FOURCC_R664 | RGB 664                            |
| FOURCC_RGB3 | RGB 24                             |
| FOURCC_BGR3 | BGR 24                             |
| FOURCC_RGB4 | RGB 32 Includes extra padding byte |
| FOURCC_BGR4 | BGR 32 Includes extra padding byte |
| FOURCC_Y888 | Y888                               |
| FOURCC_Y411 | YUV 411 interleaved 4x1 subsampled |
| FOURCC_Y422 | YUV 422 (CCIR601) interleaved      |
| FOURCC_YUV9 | Indeo YUV multiplane               |
| FOURCC_Y2X2 | YUV 2x2 subsampled multiplane      |
| FOURCC_Y4X4 | YUV 4x4 subsampled multiplane      |
| FOURCC_Y644 | YUV 4x4 subsampled 2-plane.        |
| FOURCC_VGA  | VGA 16 Color mode multibit plane   |

Figure 1: DIVE buffer formats.

essential to most applications. I have seen Full-Screen DIVE freeze some systems when the user moves the mouse, because the hardware attempts to write to the old screen buffer, which was for the desktop. Several alternatives to IBM's Full-Screen DIVE mechanism are appearing. However, I cannot recommend

using the implementation at this point.

## Looking for more

Additional information on DIVE is provided in IBM's Developer Connection Toolkit. There you will find full descriptions of all the DIVE functions and additional examples.

## Listing 2: DIVE drawing thread.

```
//***** DRAW THREAD *****
void APIENTRY fDrawProc (char *ImageFileName)
{
    HAB          hab;
    QMSG         Message;
    DIVEOBJ      *MyDiveObject;
    hab = WinInitialize( 0 );
    gqDrawQueue = WinCreateMsgQueue( hab, 0 );
    WinCancelShutdown( gqDrawQueue, TRUE );
    gDrawReady = TRUE;
    MyDiveObject = new DIVEOBJ (ImageFileName);
    MyDiveObject->Location (0,0,1,1);
    // Message Loop begins here
    do {
        WinGetMsg( hab, &Message, OL, OL, OL );
        switch( Message.msg )
        {
            case UM_VRNDIS:
                MyDiveObject->VRN_Disable ();
                break;
            case UM_VRNENA:
                MyDiveObject->VRN_Enable (ghMainWinClient,ghMainWinFrame);
                break;
            case UM_RELPAL:
                MyDiveObject->Realize_Palette ();
                break;
            case UM_PAINT:
                MyDiveObject->Blit ();
                break;
        }
    } while( Message.msg != UM_EXIT );
    delete (MyDiveObject);
    WinDestroyMsgQueue(gqDrawQueue);
    WinTerminate(hab);
    DosExit( EXIT_THREAD, OL );
}

// Initialize this thread to PM
// Get a message queue
// Cancel WM_QUIT message
// Ready to receive messages

// Eliminate the message queue
// Proper exit of PM
// Proper thread exit
```



```

struct SETUP_BLITTER {
  ULONG      ulStructLen;           // Length of structure.
  BOOL       fInvert;              // Image is inverted on blit.

  FOURCC     fccSrcColorFormat;    // Source data format.
  ULONG      ulSrcWidth;           // Width in pixels.
  ULONG      ulSrcHeight;          // Height in pixels.
  ULONG      ulSrcPosX;            // X-coordinate position of source
  ULONG      ulSrcPosY;           // Y-coordinate position of source
  ULONG      ulDitherType;         // Dither type.
  FOURCC     fccDstColorFormat;    // Destination color format.
  ULONG      ulDstWidth;           // Destination width in pixels.
  ULONG      ulDstHeight;          // Destination height in pixels.
  LONG       lDstPosX;             // Destination X-position
  LONG       lDstPosY;            // Destination Y-position
  LONG       lScreenPosX;          // Screen X-position for output.
  LONG       lScreenPosY;          // Screen Y-position for output.
  ULONG      ulNumDstRects;        // Number of visible rectangles.
  PRECTL     pVisDstRects;         // Pointer to array of dest rectangles.
};

```

Figure 2: DIVE SETUP\_BLITTER structure.

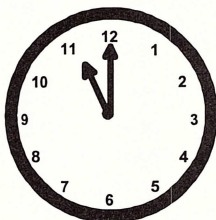
DIVE will provide a great increase in performance, but it must be used carefully to prevent video corruption or system freezing. As with any method of circumventing an operating system's usual routines, you have to know exactly what you are doing. **OS/2**

David A. Braun is the president of Meridian Software, which is currently working on a new DIVE-based game, *Seeds of Discord*. He also does custom programming work for computer-based life testing systems. He can be reached via e-mail at [dabraun@ibm.net](mailto:dabraun@ibm.net).

## Credits

Thanks to IBM's Developer Connection for information on using the OS/2 DIVE subsystem. The complete source for the DIVE demonstration program can be found on CompuServe's OS2AVEN (OS/2 Magazine Section).

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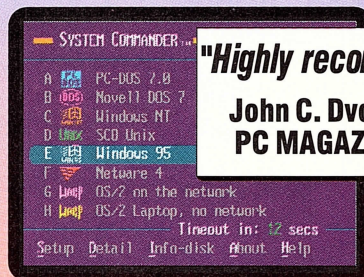
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Reader Service No. 16



# Going DirectToSOM with C++

The devil is in the details. **By Scott Danforth**

**D**irectToSOM (DTS) C++ is based on the following simple principle: When you define a C++ class that descends from SOMObject, the compiler implements it using SOM. Thus, you can use all of C++ to define and use SOM classes, which is great news for the Workplace Shell (WPS) and other SOM-based frameworks.

But, as is often the case with simple ideas, the devil is in the details. C++ is not all that simple in the first place. And its object model is somewhat different from SOM's model. So, although DTS C++ makes it easier than ever before to define SOM classes, you've got to expect some pretty interesting details. If you want to use DTS C++ to do WPS programming, you'll be more successful (and less frustrated by the problems that arise) if you understand some of these details.

The problems that you'll run into mostly relate to the evolving status of DTS C++ compilers and supporting tools. Also, some modification of the WPS's Interface Definition Language (IDL) files is required. To help out, I'll share my perspective on some of these things and illustrate the resulting ideas with a simple WPS class. Let's assume that you're generally familiar with the System Object Model and Workplace Shell programming.

## Can your object model do this?

SOM was chosen to implement the WPS for a number of reasons. These include SOM's neutrality with respect to languages and compilers (any language that can call external procedures can use SOM) and its support for release-to-release binary compatibility. DTS C++ classes gain these benefits while offering SOM programmers enhanced performance and new capabilities. (For example, you can now have SOM objects as local variables on your stack, with full constructor/destructor support.)

Another important reason for using SOM is that it supports the WPS programming model, a particular set of intentions for how programmers should use subclassing and class replacement to inherit and specialize the behavior of WPS objects. However, the WPS programming model relies on aspects of SOM that are not represented by corresponding C++ capabilities. What does a DTS C++ programmer do about these things?

For example, the WPS programming model requires the ability to define metaclasses and perform parent method calls from overrides. But the C++ object model includes neither metaclasses nor parent method calls. How do you access these non-C++ capabilities when programming in DTS C++?

**Metaclasses.** SOM metaclasses are supported by a DTS C++ pragma. The following DTS C++ header file illustrates use of this pragma on line 6 to define a subclass of **WPFolder** with a corresponding metaclass.

```
1.
2. struct M_MyFolder : M_WPFolder {
3. // new class methods, variables, and
   overrides...
4. };
5. struct MyFolder : WPFolder {
6. #pragma SOMMetaclass(*,M_MyFolder)
7. // new instance methods, variables, and
   overrides...
8. };
```

In DTS C++, any struct or class that derives from a SOM class is also a SOM class itself. Thus, **M\_MyFolder** and **MyFolder** in this example are SOM classes because **M\_WPFolder** and **WPFolder** are SOM classes (ultimately, because they descend from **SOMObject**). The file *wpfolder.hh* and those that it includes provide this information to the DTS C++ compiler.

DTS C++ header files can be written by DTS C++ programmers, or can be produced from IDL by the **SOMObjects Toolkit hh emitter**. For example, to produce *wpfolder.hh* from *wpfolder.idl* a **SOMObjects compiler command** is

```
sc -ssh -mnoqualifytypes -musehpass -S1000000.
wpfolder.idl
```

where *wpfolder.idl* is the interface definition for **WPFolder**, provided by the Developer's Toolkit that comes with VisualAge C++. The reason for the **-mnoqualifytypes** switch is that the hh emitter uses nested C++ classes to implement name scoping that corresponds to modules in IDL.



Normally, the SOM compiler prepends module names to interface names (to create what are called C-scoped names), but the switch prevents this, as required to support the desired mapping approach. The `-musehpass` means that the emitter should emit `C_h passthru` statements if no `C_hh passthru` statements are found. This is important because much of the information required by WPS programs is located in `C_h passthru` statements. The `-S` switch increases the string table size.

**Parent method calls.** Parent method calls are an important part of the WPS programming model. WPS classes introduce various "hook" methods that are invoked when handling desktop events. Subclasses tie into the overall operation of desktop objects by overriding these methods. Overrides participate in the overall handling of an event and then make a parent method call so ancestor classes can participate, too.

The semantics of a parent method call are based on the actual run-time class hierarchy. You can think of a parent call as starting from the class whose override is executing and then searching up the run-time class hierarchy for the next definition of the method. In single-inheritance SOM class hierarchies such as the WPS, the function `somParentResolve` can be used to make parent method calls.

The closest concept in C++ is a "non-virtual" method call, which is denoted with the following syntax:

```
obj->X::foo(...)
```

where `X` is any class that defines or inherits the virtual function `foo`. However, this syntax is not restricted to overrides, and there is no concept of starting from a "current" class and searching upwards in the class hierarchy for the next definition. Instead, `X`'s implementation for `foo` is used. In SOM, this call is done using the function `somClassResolve` and is different from a parent method call. The reason for the difference concerns class replacement, a powerful and important feature of the WPS programming model. Let's review how class replacement works.

As shown in Figure 1, different user-defined classes can decide to specialize the behavior of a WPS framework class in different ways (for example, to add different items to the folder pop-up menu). In this example, after class `A` is built, it "replaces" `WPFolder`. After-

wards, if the WPS creates folder objects on the desktop, they will actually be instances of `A`. Also, when `B` is built as a subclass of `WPFolder`, it actually receives `A` as its parent class (instead of `WPFolder`). Then `B` replaces `WPFolder`, so that when `C` is built, its parent is actually `B`. After all these classes are built, correct functioning of desktop folders (which will be instances of `C`, rather than of `WPFolder`) requires the parent calls diagrammed in Figure 1. This gives each class's override a chance to participate in folder events.

Of course, nonvirtual method calls to `WPFolder` will simply call `WPFolder`'s code. So, if `C` used a nonvirtual method call to invoke its static parent's code (remember, `C` doesn't know about `A` or `B`), this would call `WPFolder`'s code and skip `B` and `A`'s overrides. This is why parent method calls are important in the WPS programming model.

Currently available DTS C++ compilers don't provide special support for making SOM parent method calls. This

## A SOM Glossary

**DLL:** A Dynamic Link Library is a way of packaging binary code and data areas that can be concurrently used by different OS/2 processes.

**DTS:** DirectToSOM describes a compiler that supports an object-oriented language by generating code that uses SOM to implement objects.

**Emitter:** SOM language bindings are generated by the SOM compiler (which parses IDL) and by various "backends" called emitters. These consume an intermediate representation provided to them by the compiler. Different binding files are created by using different emitters.

**IDL:** The Interface Definition Language is defined by the Object Management Group's CORBA for specifying object interfaces and other types. SOM classes (including WPS classes) are declared using IDL.

**Metaclass:** This is a class whose instances are classes.

**OMG CORBA:** The Object Management Group's Common Object Request Broker Architecture (CORBA) specification primarily includes a definition of IDL and a specification of how users can write programs that invoke operations provided by an object interface defined in IDL.

**Override:** In object-oriented programming, a class can redefine the implementation of an inherited method (so the method execution will be appropriate to instances of the class). This is called an override.

**passthru:** This modifier in SOM IDL is used to request that certain text be passed through to a file when it is created by a SOM emitter.

**RRBC:** Release to Release Binary Compatibility is a characteristic of SOM class libraries that allows new versions of classes (packed within OS/2 DLLs) to be distributed without requiring users to recompile the code that uses these DLLs.

**SOM:** The IBM System Object Model.

**SOMObject:** The root class of any SOM class hierarchy, `SOMObject` is the only SOM class that doesn't have a parent.

**SOMObjects Toolkit:** This IBM product contains the SOM run time, `DSOM`, and supporting tools. This product is provided by the developers of SOM and is separate from the OS/2 Developer's Toolkit or other packages such as Visual Age C++ for OS/2 (which contains a version of the OS/2 Developer's Toolkit and various SOM support).

**VAC++:** Visual Age C++ for OS/2 is an IBM product containing, in addition to a C++ compiler, a number of other tools and accessories useful for developing OS/2 applications. `VAC++` includes a version of the SOM kernel and other supporting SOM utilities.

**WPS:** The OS/2 Workplace Shell is a SOM class framework.



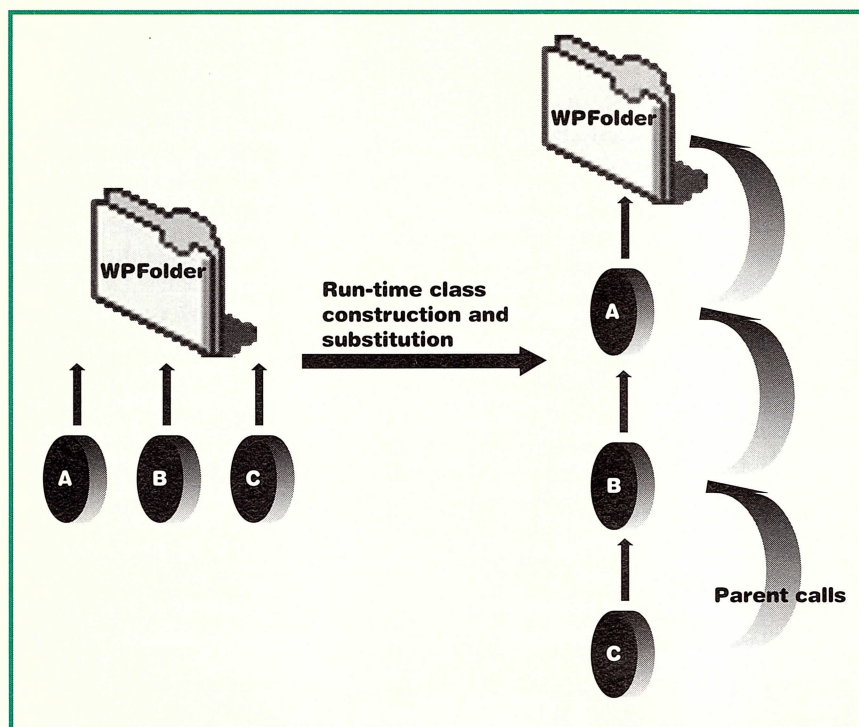


Figure 1: Class replacement and parent method calls.

discrepancy should be remedied in the near future, but in the meantime, performing parent method calls by using the SOM API directly is necessary. Luckily, a development version of the SOMObjects Toolkit hh emitter provides the necessary support with various macro and data structure definitions.

### A pop-up example

Let's define a WPFolder subclass that adds a pop-up menu option that responds with a DosBeep. The WPS code is simple, so we can focus on the DTS C++ details.

**Start with an IDL declaration.** Theoretically, there should be no need to use IDL when defining subclasses of WPS framework classes. You should be able to start with a .hh file. Currently, however, IDL is useful, because the hh emitter (which takes IDL as input) includes parent method call support in the .hh file that it produces. WPS programmers are used to starting with IDL, so it's nice that using DTS C++ doesn't preclude this approach (Listing 1).

The important modifier here is **dtsdefaults**. It tells the emitter that you are using DTS C++ to implement

the class, and you want to let the DTS C++ compiler automatically define constructors, destructors and assignment operators for you. If you forget to use **dtsdefaults**, it isn't serious, but you'll have additional code to define in your implementation. Also, there's a **C\_hh passthru** used to include the type definitions needed by your implementation.

**Produce the necessary header files.** We can begin creating the needed .hh headers with the following command:

```
sc -shh -mnoqualifytypesJ
-S1000000 ex1.idl
```

But here's where we start running into problems. The **int** on line 23 of *wptypes.idl* needs to be changed to **long**, and the overrides of **somInit** and **somUninit** on line 857 of *wpobject.idl* need to be deleted.

*wptypes.idl* is interesting. Its only purpose is to give the SOM compiler a consistent picture of the data types used in WPS interfaces. So a header corresponding to this IDL is not actually used for programming. Instead, the actual data types and definitions used for WPS programming are contained in the header files *os2.h* and *pmwp.h* (such as those as made available by the above **C\_hh passthru**) and in IDL **passthru** statements.

As for *wpobject.idl*, it makes no sense to override both **somInit** and **somDefaultInit**, and the new **chk** emitter used by the SOMObjects Toolkit flags this error. At run time, the **somDefaultInit** method will be chosen, so it's correct to delete **somInit**. To avoid semantic checks, you can invoke the SOM compiler using the **-mnochk** switch, but this solution is not recommended.

### Listing 1. IDL declaration.

```
// file: ex1.idl
#include <wpfolder.idl>
interface EX1: WPFolder {
    implementation {
        dtsdefaults;
        majorversion=1; minorversion=1;
        wpModifyPopupMenu: override; // Add option to popup menu
        wpMenuItemSelected: override; //Process menu selections
        passthru C_hh = ""
        " #define INCL_WIN"
        " #define INCL_DOS"
        " #define INCL_GPIBITMAPS"
        " #define INCL_DOSERRORS"
        " #include <os2.h>"
        " #define INCL_WPFOLDER"
        " #include <pmwp.h>"
        " #define ID_EX1MENU (WPMENUID_USER+1) // menu option"
        " #define ID_DOEX1THING (WPMENUID_USER+2) //selection";
    };
};
```



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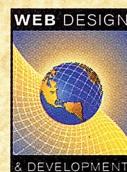
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Once *ex1.hh* has been created, we need the *.hh* files for EX1's ancestors (because these will be included into an overall compiled program). These ancestors are **WPFolder**, **WPFileSystem**, **WPObj**, and **SOMObject**.

The hh emitter is used to create the corresponding *.hh* header files. Remember that WPS IDL doesn't include specially designed **C\_h passthru**. Actually, it should be possible to create a self-contained IDL for the WPS, which would get rid of the need for **passthru** statements entirely. But in the meantime, we need to deal with the current IDL, which provides **C\_h passthru** statements.

Using **-musehpass** when emitting WPS header files helps, but this isn't quite enough. The **C\_h passthru** on line 255 of *wpobject.idl* needs to be changed to **C\_h\_after**. Also, it is necessary to delete a few C language macro definitions that aren't appropriate for DTS C++. These are on lines 259-264 and lines 816-819. The macro definition on lines 267-272 raises questions but doesn't influence this example. After the above changes are made, the following commands produce the necessary headers:

```
set hh=sc -shh -mnoqualifytypes
%hh% somobj.idl somcls.idl
    somcm.idl
%hh% -musehpass -S1000000
    wpfolder.idl wpflsys.idl
    wpobject.idl
```

We generate headers for the SOM kernel classes because we want all bindings included by our program to correspond to the same emitter level. (There are no **passthru** statements in the kernel IDL.) To help you verify emitter output, version numbers are provided at the top of emitted *.hh* files. For example, here's the top of the *ex1.hh* file used for this example:

```
// Generated by the IBM
"DirectToSOM" emitter for
C++ (V1.125)
// Generated 02/16/96 08:36:34
EST
// The efw file is version 1.65
```

## Listing 2. Implementation for EX1.

```
//file: ex1.cpp

// Add an EX1 option to the popup menu
BOOL EX1::wpModifyPopupMenu(HWND hwndMenu, HWND hwndCnr, ULONG
    iPosition)
{ wpInsertPopupMenuItems(hwndMenu,iPosition,gethmod(),
    ID_EX1MENU,0);
return (SOM_PARENT_EX1(this,wpModifyPopupMenu,WPObj,
    SOM_MTOKEN_WPObj(wpModifyPopupMenu))
    (this, hwndMenu, hwndCnr, iPosition));
}

// Perform the menu action when selected
BOOL EX1::wpMenuItemSelected(HWND hwndFrame, ULONG ulMenuId)
{
    if (ulMenuId == ID_DOEX1THING) {
        DosBeep(1000,200); DosBeep(1000,200); DosBeep(1000,200);
        DosBeep(800,400);
        return 1;
    } else return (SOM_PARENT_EX1(this,wpMenuItemSelected,WPObj,
        SOM_MTOKEN_WPObj(wpMenuItemSelected))
        (this, hwndFrame, ulMenuId));
}
```

The emitter is in the *emithh.dll* file, which is located by **libpath** (and the **beginlibpath** environment variable). The *efw* file is *cpp.efw*, a text file that defines output patterns used by the emitter. It's located by the **sminclude** environment variable. Minor changes to hh emitter output can be made by editing this file.

### Write the implementation.

Once the necessary *.hh* files have been created, we can write and compile an implementation for EX1. To save space here, a definition for the **gethmod** function is omitted. This locally defined function uses the SOM class manager to locate the class file for EX1, calls **DosQueryModuleHandle** for this file, and returns the result. Otherwise, the complete implementation source is shown in Listing 2.

**SOM\_PARENT\_EX1** is a macro provided by *ex1.hh* that supports parent method calls from any EX1 method override. It takes four arguments: the target object, the method name, the class that introduces the method, and the method token. This evaluates to a pointer to the parent's method procedure, which is applied to the method call arguments. The most difficult part of using the parent

call macro is knowing the introducing class for a method. (This information is also required to choose the name of the method token macro.) The hh emitter produces the comment "new method: <mname>" when a method is introduced, so you can grep for this. In the above code example, both **wpModifyPopupMenu** and **wpMenuItemSelected** are introduced by **WPObj**.

Obviously, compiler support for parent method calls will be a great improvement. Then the compiler will be responsible for determining the introducing class. Anticipating one possible syntax, a parent method call might be coded as in the following example:

```
EX1::__parent->
    wpModifyPopupMenu(hwndMenu,
        hwndCnr,iPosition);
```

### Write and run a makefile.

Running **nmake** on the makefile in Listing 3 creates an *ex1.dll* file.

**Test the example.** The following **REXX .cmd** file creates an instance of EX1 on the desktop. When an EX1 instance is created, its pop-up menu includes the new EX1 option, and selecting it plays the **DosBeeps** programmed in Listing 2.



```
/* */
call RxFuncAdd
  'SysLoadFuncs', 'RexxUtil',
  'SysLoadFuncs'
call SysLoadFuncs
say SysCreateObject("EX1",
  "Ex1 Example", "<WP_DESKTOP>",
  "OBJECTID=<AnEx1>")
```

## Wrapping it up

We've looked at important issues relating to DirectToSOM C++ development, in particular how to implement Workplace Shell classes. The example was programmed using the IBM Visual Age C++ Compiler 3.0 with Corrective Service Disk 3 installed and using a current development build of the IBM SOM-objects Toolkit. A *dtswps.zip* file containing the example described in this article (and the necessary SOMobjects emitter support) will be made available on CompuServe, in OS/2 Magazine's section of the OS2AVEN forum.

OS/2

## Listing 3. Makefile.

```
.SUFFIXES:
.SUFFIXES: .cpp .obj .dll .idl .rc .res .pdl .def
.cpp.obj:
icc /c /Gd- /Se /Re /ss /Ms /Gm+ /Ge- /Ti+ -I. -c $<
.idl.def:
sc -p -sdef -S1000000 $(@B).idl
.idl.hh:
sc -p -shh -mnoqualifytypes -S100000 $(@B).idl
all: ex1.dll
ex1.obj: $$(@B).cpp $$(@B).hh
ex1.dll: $$(@B).def ex1.obj ex1.res
icc /B" /de" /Feex1.dll /Fmex1.map ex1.def ex1.obj
rc -p -x *.res *.dll
mapsym ex1.map
ex1.res: $$(@B).rc $$(@B).hh
rc -r *.rc *.res
```

Scott Danforth joined the IBM SOM team in 1991, where he designed and implemented SOM's native mode C++ bindings, SOM's multiple inheritance model, SOM's derived metaclass support, and SOM's Metaclass Cooperation Framework. He represented IBM in the

working group that produced the CORBA C++ mapping specification and worked with MetaWare, VisualAge C++, and others at IBM to design DTS C++ and implement the SOM extensions that support it. His publications include the book *Objects for OS/2*.

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## A Kilometer Is Not a Kilometer

BY ROGER SESSIONS

**B**uddha is quoted as saying, "A rose is not a rose. Therefore it is a rose." By that he means that until we learn to look beyond our preconceptions of a rose, we cannot see the true rose. We must look deeply and wisely at things in order to appreciate their real character. In object-oriented programming, we often become attached to our preconceptions. One of our favorite preconceptions is performance. Many people reject the whole paradigm because of "the unacceptable performance overhead." Others choose between languages based on how quickly a method can be invoked.

In this column, we are going to look more deeply (and hopefully, more wisely) at the whole issue of performance in object-oriented systems. An analogy might help to start things off. Suppose you have been assigned the task of moving  $x$  units of  $y$  a distance of  $z$  kilometers. The first thing you do is look for a vehicle in which you can load up your  $x$  units of  $y$ . Let's say you have two vehicles from which to choose. The first takes 30 seconds to travel one kilometer. The second takes three minutes. Which vehicle is best suited to your task? The answer is: You don't know. It depends on what  $x$  and  $y$  are. If  $x$  is two dozen and  $y$  is eggs, then you will choose the sports car. If  $x$  is 100 tons and  $y$  is coal, you will choose the river barge.

### Performance factors

Performance is only relevant when workload is taken into account. When discussing the performance of method invocations, we need to look at three factors of workload: the cost

of invoking the method, the number of times the method will be invoked, and the amount of work the method will do. The relationship between these factors is as follows:

$$TC = (CIM + COW) * NMI$$

where

$$TC = \text{Total Cost}$$

$$CIM = \text{Cost of Invoking Method}$$

$$COW = \text{Cost of Work (in the method)}$$

$$NMI = \text{Number of Method Invocations}$$

In general, when we write software, we want the Total Cost (TC) to be as low as possible. We can keep it low by focusing on any combination of the three factors that contribute to TC. Let's look at some case studies.

### Case 1

In case 1, let's say the Cost of Invoking a Method (CIM) is equal to 0.80 microseconds. Keep in mind that 1,000 microseconds equals 1 millisecond and 1,000 milliseconds equals 1 second. Let's also say that the Cost of Work (COW) of that method is 1.0 microsecond. You might assume that the CIM is a significant factor in this equation, but wait! Suppose the method is only invoked once in a program that takes 10 seconds to run. The TC for that method is

$$TC = (CIM + COW) * NMI$$

$$= (0.80 \text{ microseconds/invo-} \\ \text{cation} + 1.0 \text{ microsec-} \\ \text{onds/invo-} \\ \text{cation}) * \\ 1 \text{ invocation}$$

$$= (0.80 + 1.0) * 1$$

$$= 1.80 \text{ microseconds}$$

According to these calculations, our method only contributes 1.80 microseconds out of a total run time of 10 seconds (10 million microseconds). The total fraction of time spent in this method is 1.80/10,000,000—an infinitesimal portion. People worrying about the performance of this method should be worrying more about their own performance!

### Case 2

Let's look again at case 1, but this time, let's ask a different question: How many times would we have to invoke the method before the TC of that method would equal at least 1% of the run time of the whole program? The run time of the whole program is 10 seconds, or 10 million microseconds. We will reach 1% of 10 million microseconds when we reach 100,000 microseconds. Plugging these new numbers into the equation yields

$$TC = (CIM + COW) * NMI$$

$$100,000 \text{ microseconds} =$$

$$(0.80 \text{ microseconds/} \\ \text{invocation} + \\ 1.0 \text{ microseconds/} \\ \text{invocation}) * \\ x \text{ invocations}$$

$$100,000 = (0.8 + 1.0) * x$$

$$= 1.8 x$$

Therefore,

$$x = 100,000 / 1.8$$

$$= 55,555$$

In other words, we have to invoke this method more than 55,000 times before it contributes even 1% to the run time of this program.



# The World of Objects

## Relative costs of invoking methods

What is the cost of invoking a method? The answer to this question depends both on the type of method and what we are using as a base line. Let's look at the cost of running a given code segment using each of five different coding techniques. Each code technique offers both increased benefits and increased costs. In this section, we'll see how these two are related.

When studying the measurements I give, you should focus more on the relationships between numbers and the measurement techniques rather than on the absolute numbers, which will change depending on compiler optimization, machine configuration, and environment conditions. My particular machine is a 100MHz processor with 16MB of memory, and I have not used any code-optimization compiler switches.

Let's start by looking at standard C++ virtual method invocation. My C++ dog definition and implementation is shown in Listing 1.

As you can see from Listing 1, my dog supports a method named `runOneKilometer`. I am going to measure the cost of invoking this method.

My measurement program is shown in Listing 2.

As you can see from Listing 2, I can run this program with various numbers of iterations. I usually run the program at least three times choosing iteration numbers resulting in run times between 10 and 240 seconds. Less than that makes for inaccurate measurements. More than that makes for a high boredom factor. I start my measurements as soon as the iteration starts and stop when the iteration stops.

I ran this program with 20, 50, and 100 million iterations, yielding run times of 16, 43, and 81 seconds, respectively. The program automatically calculates the milliseconds per kilometer, which for my runs came out to

be .00080, .00086, and .00081, respectively. Let's use the average: .00082 milliseconds.

Next, let's look at our baseline, which does the equivalent work without using object-oriented programming.

I have used two baselines. The first (Listing 3) does the equivalent work completely inline. The second (Listing 4) does the equivalent work in a procedure call.

I ran Listing 3 (the inline program) with 100, 200, and 500 million iterations, yielding run times of 19, 38, and 94 seconds, and all weighing in at the identical .00019 milliseconds per iteration.

I ran Listing 4 (the procedural version) with 50, 100, and 200 million iterations, yielding run times of 29, 57, and 113 seconds, weighing in at .00056 ± .00001 milliseconds per iteration.

The difference between using C++ virtual methods

(.00082 milliseconds) and procedure calls (.00056 milliseconds) is .00082 - .00056, or .00026 milliseconds. The

### Listing 1: C++ dog.

#### Definition:

```
class dog {
public:
    virtual void runOneKilometer();
    long int howManyKilometers();
    dog();
private:
    long int kilometersRan;
};
```

#### Implementation:

```
#include "dog.hpp"

void dog::runOneKilometer()
{
    kilometersRan++;
}
dog::dog()
{
    kilometersRan=0;
}
long int dog::howManyKilometers()
{
    return kilometersRan;
}
```

### Listing 2: C++ Measurement program.

```
#include <stdio.h>
#include <stdlib.h>
#include "dog4.hpp"

int main()
{
    long iterations;
    long n, seconds;
    float mspk;
    dog4 *snoopy = new dog4();

    printf("Measuring virtual C++ method invocations.\n");
    printf("How many kilometers? ");
    fflush(stdout);
    scanf("%d", &iterations);

    for (n=0; n<iterations; n++) {
        snoopy->runOneKilometer();
    };

    printf("Snoopy ran %d kilometers\n",
        snoopy->howManyKilometers());
    printf("How many seconds did that take? ");
    fflush(stdout);
    scanf("%d", &seconds);
    mspk = (float) (seconds * 1000) / (float) (iterations);
    printf("Total milliseconds to go one kilometer: %10.6f", mspk);
    exit(0);
}
```



difference between using procedure calls (.00056 milliseconds) and inline code (.00019 milliseconds) is .00056 - .00019, or .00037 milliseconds.

In other words, it is significantly more expensive to go from inline coding to procedural coding than it is to go from procedural coding to objects. Yet, the wisdom of procedures is universally accepted, while many wonder if they can "afford the penalty" of using objects.

This is a very important point and cannot be overemphasized. The use of object-oriented programming does not result in any significant performance degradation. Please do whatever you can to dispell this myth.

Let's go higher up the food chain. Standard SOM objects add language independence and upward binary compatibility to C++ objects. DSOM adds the ability to distribute objects across machines. What do we pay for these benefits?

Listing 5 shows a SOM equivalent of the C++ dog in Listing 1.

This dog can be instantiated locally or remotely. Listing 6 shows a local instantiation; Listing 7 shows a re-

mote instantiation. Listing 7 is substantially like Listing 6, so I have shown only the significant difference, which is in the object instantiation.

The run time for Listing 6, which adds standard SOM benefits to the C++ object, is 13, 24, and 59 seconds for 10, 20, and 50 million invocations, weighing in at .0012 milliseconds. The difference between SOM and C++ (about .00038 milliseconds) is similar to the difference between C++ and procedures (.00026 milliseconds).

Let's put this in context of some actual work. I modified Listing 2 to measure the time required to fill a 100-byte buffer with a given character. Most of the code is unaffected. However, the new loop is shown in Listing 8.

The program shown in Listing 8 took .019 milliseconds/iteration to run. How would the cost of running one iteration of this code as a C++ object compare to the cost of running one iteration of this code as a SOM local object? Let's go back to our formula:

$$TC = (CIM + COW) * NMI$$

where

TC = Total Cost

CIM = Cost of Invoking Method

COW = Cost of Work (in the method)

NMI = Number of Method Invocations

For C++, the cost for one iteration would be:

$$TC = (.00083 + .019) \text{ milliseconds/iteration} \\ = .01983$$

For SOM, the cost for one iteration would be:

$$TC = (.0012 + .019) \text{ milliseconds/iteration} \\ = .0202$$

The difference between SOM (local) and C++ both doing this relatively modest amount of work is less than 2%.

What about distributing the object using DSOM? Here I would expect to see a significant decline because of

#### Listing 3: Inline program.

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    long iterations;
    long kilometers = 0;
    long n, seconds;
    float mspk;

    printf("Measuring in line\code.\n");
    printf("\nHow many kilometers? ");
    fflush(stdout);
    scanf("%d", &iterations);

    for (n=0; n<iterations; n++) {
        kilometers++;
    };

    printf("How many \seconds did that take? ");
    fflush(stdout);
    scanf("%d", &seconds);
    mspk = (float) ((seconds * 1000) / ((float) (kilometers)));
    printf("Total milliseconds to go one kilometer: %10.6f", mspk);
    exit(0);
}
```

#### Listing 4: Procedural program.

```
#include <stdio.h>
#include <stdlib.h>
void runOneKilometer(long *value);

int main()
{
    long iterations;
    long kilometers = 0;
    long n, seconds;
    float mspk;

    printf("Measuring procedure call.\n");
    printf("How many kilometers? ");
    fflush(stdout);
    scanf("%d", &iterations);

    for (n=0; n<iterations; n++) {
        runOneKilometer(&kilometers);
    };

    printf("How many seconds did that take? ");
    fflush(stdout);
    scanf("%d", &seconds);
    mspk = (float) (seconds * 1000) / (float) (kilometers);
    printf("Total milliseconds to go one kilometer: %10.6f", mspk);
    exit(0);
}

void runOneKilometer(long *value)
{
    (*value)++;
}
```



the work involved in marshalling method calls. (If unfamiliar with DSOM, see the April 1996 issue, "Distributed Objects," pp. 44-47.)

I ran Listing 7 in the best possible case, on a single machine with no overhead for networking. I was using the beta version of SOM 3.0.

I ran 10, 20, and 30 thousand iterations. I had to go from millions of iterations to thousands to complete the tests in a reasonable time. The iteration run times were 66, 131, and 199 seconds, for an average iteration time of 6.59 milliseconds.

This average iteration time was almost a 5,500-fold decline from local SOM. In other words, you could run almost 5,500 local SOM methods for the cost of one remote DSOM method—which may seem like a huge degradation, but what are we getting for this cost? Object Distribution!

Comparing DSOM to C++ virtual methods doesn't make sense. We would never use DSOM for small C++-like classes. A fair comparison is DSOM to Remote Procedure Calls (RPC), the procedural equivalent to a remote method call. Here DSOM compares very favorably.

The cost of running DSOM across a network is approximately twice the cost of running it on a single machine, bringing the cost to about 14 milliseconds, about 30% more expensive than running RPC (RPC performance numbers provided by Virgil Albaugh). This cost difference is similar to the cost difference between procedures and virtual methods. Keep in mind that DSOM 3.0 is still in beta and will probably improve.

In order to use DSOM effectively, you need to make sure that the cost of running the method is at least 10 times the cost of invoking the method. This means that DSOM should not be used for method workloads of less than about 140 milliseconds.

On my system, 70 milliseconds is approximately the time required to open a file, write a single element, and close the file. For this workload, DSOM will contribute only about 20% of the total overhead of the method invocation, about the same as RPC would have contributed.

There is another scenario under which DSOM makes sense. If the number of method calls is low, the

## Listing 5: SOM dog.

### Definition:

```
#include <somobj.idl>
interface somdog : SOMObject {
    void runOneKilometer ();
    long howManyKilometers();
    implementation {
        long kilometersRan;
        override: somDefaultInit;
        somDefaultInit: init;
        releaseorder: runOneKilometer, howManyKilometers;
        dllname = "dog.dll";
    };
};
```

*cont'd on p. 46*

## Listing 6: Local instantiation of SOMDog #include <stdio.h>.

```
#include <stdlib.h> #include "somdog.h"

int main()
{
    long iterations;
    long n, seconds;
    float mspk;
    Environment *ev;
    somdog snoopy = somdogNew();

    ev = SOM_CreateLocalEnvironment();

    printf("Measuring language independent SOM method_
        invocations.\n");
    printf("How many kilometers? ");
    fflush(stdout);
    scanf("%d", &iterations);
    for (n=0; n<iterations; n++) {
        _runOneKilometer(snoopy, ev);
    };
    printf("Snoopy ran %d kilometers\n", _
        howManyKilometers(snoopy, ev));
    printf("How many seconds did that take? ");
    fflush(stdout);
    scanf("%d", &seconds);
    mspk = (float) (seconds * 1000) / (float) (iterations);
    printf("Total milliseconds to go one kilometer: %10.6f", mspk);
    exit(0);
}
```

## Listing 7: Remote instantiation of SOMDog.

```
/* ... */
ev = SOM_CreateLocalEnvironment();
SOMD_Init(ev);

snoopy = _smdNewObject(SOMD_ObjectMgr, ev, "somdog", "");
/* ... */
```

## Listing 8: Loop with buffer filling code.

```
for (n=0; n<iterations; n++) {
    kilometers++;
    for (n2=0; n2<200 ;n2++) {
        buff1[n2] = 'a';
    }
    buff1[200] = 0;
};
```



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#### Listing 5: Cont'd from 45.

##### Implementation:

```
#include "somdog.ih"

SOM_Scope void SOMLINK runOneKilometer(somdog somSelf,
    Environment *ev)
{
    somdogData *somThis = somdogGetData(somSelf);
    somdogMethodDebug("somdog","runOneKilometer");
    _kilometersRan++;
}

SOM_Scope long SOMLINK howManyKilometers(somdog somSelf,
    Environment *ev)
{
    somdogData *somThis = somdogGetData(somSelf);
    somdogMethodDebug("somdog","howManyKilometers");
    return _kilometersRan;
}

SOM_Scope void SOMLINK somDefaultInit(somdog somSelf,
    som3InitCtrl* ctrl)
{
    somdogData *somThis; /* set in BeginInitializer */
    somInitCtrl globalCtrl;
    somBooleanVector myMask;
    somdogMethodDebug("somdog","somDefaultInit");
    somdog_BeginInitializer_somDefaultInit;
    somdog_Init_SOMObject_somDefaultInit(somSelf, ctrl);
    _kilometersRan=0;
}
```

overall cost of DSOM will also be low. For example, 10 DSOM method calls in a program run time of 10 seconds will contribute about 140 milliseconds—about 1% of the total run time. These numbers, however, do not include the cost of “finding” remote objects, which is very significant in DSOM, but which I am assuming is part of the start-up cost of the program.

So we have two choices with DSOM. We can either use it for expensive method calls, or we can use it sparingly. Either gives us the benefits of Distributed Object Programming with reasonable cost. And regardless of how we use DSOM, its cost is comparable to other distribution techniques such as RPC.

Now, those that expect to take existing C++ classes, rewrite them with DSOM, and have all their classes magically distributed, are in for a nasty shock. Object distribution requires careful planning at the front end of a project. Not a bad place to spend some of your consulting dollars, if I may be forgiven for such a self-serving point of view.

#### Epilogue

Once again, keep in mind that the absolute numbers I have reported here

are much less important than the relationships between the numbers. There is no substitute for running your own performance tests.

To help you in this endeavor, all of the code in this article is available from the SOMObjects Home Page, located at <http://www.fc.net/~roger/owatch.htm>. Look for a link leading you to code for OS/2 Magazine articles.

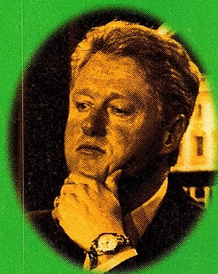
Always remember that the cost of a method is related to the cost of the method invocation, the workload of the method, the number of times the method will be invoked, and the overall run time of the program. A method is not a method. A kilometer is not a kilometer. A rose is not a rose. **OS/2**

*Roger Sessions is president of Object-Watch Inc., a company specializing in training and consulting in the use of SOM, DSOM, and related object-oriented technologies. He has spoken at over 30 conferences and has written extensively. His three books include the newly published Object Persistence: Beyond Object-Oriented Databases. Roger also publishes the SOMObjects Home Page (<http://www.fc.net/~roger/owatch.htm>) and an Internet newsletter called ObjectWatch on SOM. He can be contacted via e-mail at [roger@fc.net](mailto:roger@fc.net).*



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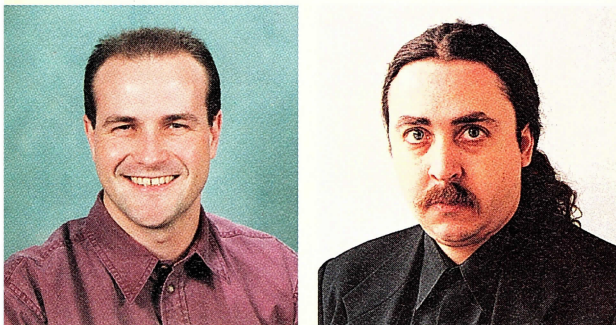


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## Caching In

BY MARK BENGE AND MATT SMITH

**L**ast issue, we continued our look into custom controls, focusing on the presentation parameters of the control. This time we'll look at how to make your control responsive to both the user and system events.

### The goal

When you create a control for use within your applications, it can be as simple or as complex as you want. Whatever the case, the desirable goal is to make the control do certain tasks as quickly as possible. One of these tasks is painting.

Understanding the messages sent to your control helps you create a more responsive one. For example, you could design the control so the painting process will query the size of the control and calculate the positions of various elements.

This approach makes sense because you want to make sure that the painting of the control correctly reflects its current size. But do you need to do it each time the control is painted?

Not really. When you look at the messages of OS/2 PM, you will see that you can precalculate the size of the control by using either `WM_ADJUSTWINDOWPOS` or `WM_SIZE` messages. These messages are only sent by the system when the size or position of the control changes. (In the case of the `WM_SIZE`, the message is not received by the control when the control is first created. The control is expected to get the size from the `CREATESTRUCT`. This is efficiently preventing unnecessary traffic from being placed on the message queue.)

By squirreling away the size, you

won't need to retrieve the size each time the control is painted.

You can speed things up even more simply by taking any calculation routines from the painting and placing them into a separate routine that is called either during the control's creation or when the control is sized.

Calculating the information once and saving is, in effect, a form of caching. Depending on the number of calculations made, you can prevent these calculations from having to be made each time the control is painted.

### Say cheese!

Another way of speeding things up is to create a bitmap image of parts of the control. For example, in our bar chart control, we currently draw the bars and scale each time the control is painted.

This method is going to be fine in most cases, but, if it's a complicated bar chart and you are using a slower machine, you'll be able to see each bar drawn. Even if the entire bar chart takes one second, which to most of us is not a long time, that is essentially 9/10 of a second too slow. Remember the old 1/10 rule?

Well, one way to accelerate things is to draw the bar chart into a bitmap. Then when you paint, you just draw the bitmap. Really quite simple and very fast.

In conjunction, you can do the initial drawing within a thread. Then when the drawing is done, you force the image to be displayed. In the meantime, you've already regained control of your machine.

A good example is the color wheel, a control you can see within the IBM Universal Resource Editor.

This control was first presented in *OS/2 Developer Magazine* ("A Color-Full Example: Using Color in Control Design," Sept/Oct 1993, pp. 46-57). The implementation of the control allows for fine gradation of the colors. For this reason, 36,000 calculations are done for the 36,000 color positions. These calculations are time consuming; therefore, the color wheel calculations and drawing are done in a background thread.

Taking a picture of the control in the form of a bitmap allows you to very quickly repaint without the heavy calculation overhead.

So why not have all controls draw themselves in a thread and use a bitmap? Good question. It all comes down to a design decision. Thread management makes things a bit tougher. Also, as machines get faster, the building and tearing down of a thread can, in effect, make the control slower than just drawing it.

Our next trick of speeding things up is the use of a permanent presentation space (PS).

Between the brute-force drawing and bitmap methods is another method in which you create a PS for use by the control at the time the control is created. When you draw, you use this PS.

Now this method may seem a bit over-done, but remember, you can place attributes into the PS so that when you draw, these attributes don't have to be set again.

Confused? Okay, take, as an example, drawing a line. Say that the control needs to draw the line in red. Under normal circumstances, you would see the following in the processing of the `WM_PAINT`:



# GUI Corner

```
hPS = WinBeginPaint(hWnd,
    NULL, NULL);
GpiSetColor(hPS, CLR_RED);
ptl.x = 0L;
ptl.y = 5L;
GpiMove(hPS, &ptl);
ptl.x = 100L;
GpiLine(hPS, &ptl);
WinEndPaint(hPS);
```

The PS is created in the **WM\_CREATE** as follows:

```
szl.cx = pcrst.cx;
szl.cy = pcrst.cy;
hpsControl = GpiCreatePS(hAB,
    WinOpenWindowDC(hWnd),
    &szl, PU_PELS |
    GPIT_MICRO |
    GPIA_ASSOC);
```

Afterwards, the PS is used in the following manner in **WM\_PAINT**:

```
hPS = WinBeginPaint(hWnd,
    hpsControl, NULL);
ptl.x = 0L;
ptl.y = 5L;
GpiMove(hPS, &ptl);
ptl.x = 100L;
GpiLine(hPS, &ptl);
WinEndPaint(hPS);
```

Okay, it may not look like much here, but if you wanted to use a particular font within the control each time you handled the **WM\_PAINT**, you would have to do the following:

```
memset(&fat, 0,
    sizeof(FATTRS));
fat.usRecordLength =
    sizeof(FATTRS);
strcpy(fat.szFacename,
    "Helv");
fat.usCodePage = 850;
fat.lMatch = lHelvMatch;
GpiCreateLogFont(hPS,
    (PSTR8) NULL, 2L, &fat);
GpiSetCharSet(hPS, 2L);
```

If you created the PS during the **WM\_CREATE**, you could use the same code in the **WM\_CREATE** and—guess what—it would only be done once, making things really simple.

An added benefit is that when you

want to draw the control or portions of it outside the **WM\_PAINT**, you just use the PS created. You don't have to issue a **WinGetPS/WinReleasePS**.

There is a drawback to this method. A control usually uses the PS of the owner. In OS/2 PM, this usage reduces the overhead in building and tearing down the PS. Along with the bookkeeping, additional memory is required to store the image attributes and other such data.

Giving the control the PS of its owner means that it doesn't have the extra memory overhead and bookkeeping. When you think about it, if you have a dialogue with 100 controls in it and each control has its own PS, the memory overhead can add up. The GPI documentation states, "A typical micro presentation space graphical application uses 315KB of GPI, engine, and display memory resource (code and data). A normal presentation space requires 114KB more than a micro presentation space."

So, you want to use the created PS sparingly. If you don't, you can place a heavy load on the system.

## Fall is in the air, a new wardrobe!

When designing your control, you can allow it to have one or more styles. For example, in OS/2 PM, the button class has nine different styles that change either the appearance or behavior. You may have thought that the only time these styles can be useful is when the control is created. But that isn't the case.

You can change the style of the button control from a radio button to a check box once it has been created by using the following:

```
flStyle =
    WinQueryWindowULong(
        hwndCtrl, QWL_STYLE);
WinSetWindowULong(hwndCtrl,
    QWL_STYLE, (flStyle &
    ~BS_RADIOBUTTON) |
    BS_CHECKBOX);
WinInvalidate(hwndCtrl, NULL,
    FALSE);
```

Then once the style has been

changed and the control is forced to be repainted, the button appears to have changed from a radio button to a checkbox.

So, what is going on here, smoke and mirrors?

Not really. It's a very useful trick to allow the control to change its capabilities dynamically. The only thing you have to do is make sure that you check to see that the style has changed at the appropriate time.

Most often, verification is done during the painting. Here you check to see if the style of the control is different than that recorded internally. When it has changed, you scurry off, recalculate things to take into consideration the changes, and then repaint the control with the new values.

Sometimes, you'll need to update the control outside the **WM\_PAINT**. When that occurs, you should check for style changes as well.

One nice way to get around this duplication of code is to create a function that retrieves the internal data pointer while at the same time checks for style changes. This work-around also allows you to use this function wherever necessary.

## Peek-a-boo!

One area that doesn't present itself in terms of performance is what happens when the control is not visible or has no size.

What you may want to do is maintain a draw flag. This flag is then used to determine if the control should be drawn or if the various display points for elements of the control should be calculated.

For example, you may have a complicated control that has several hundred lines of source code to calculate various display positions (such as points for lines). If the size of the control is zero (such as `cx == 0` and `cy == 0`), is there any need to calculate the display positions? Not really. Also, if the size is zero, is there any need to try to draw it? Nope.

In conjunction, you may want to maintain a visibility flag. If the control isn't visible, you may want to postpone certain updates.



A good example is a list box. You may be placing or removing strings from the list box during initialization of the dialogue (WM\_INITDLG). At this stage, the list box, along with other elements of the dialogue are not visible because the dialogue has not been displayed yet. So forcing an update of the visible area of the list box is just a waste of time. Remember, what seems like one line of code to you may be hundreds underneath.

## Rules of the road

Some basic rules to understand in making your control responsive are:

- Calculate the element positions of the control only when the control is first created or when it is resized.
- Perform lengthy tasks in a separate thread.
- Use created PSs if it will speed up creation of elements or drawing.
- Save bitmap images of elements if it makes sense.
- If your control allows for the style to be changed, create a function that retrieves the private data for

the control and checks the style of the control for changes at the same time, instead of checking for the style change in various locations within your window procedure like the WM\_PAINT or WM\_SIZE.

- Maintain a display/draw flag within the private data of the control that lets you prevent unnecessary painting, calculations, and so forth.

## Stay tuned, don't change that channel

Next issue, we'll be setting up shop in the area of frame controls. We'll identify some powerful messages and techniques required to build frame extensions which allow you to enhance the functionality of the frame control (WC\_FRAME). **OS/2**

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## Resources:

You can download *ctrl4.exe* from these electronic sources:

CompuServe's OS2AVEN forum (OS/2 Magazine Section).

File area 11 on the IBM PCC BBS, (919) 517-0001, OS/2 Tools section on the OS/2 BBS for IBM TALKLink customers.

FTP to [prominare.com](http://prominare.com) and log in as anonymous. The source is located in the */pub/prominare/guicornercodecache* subdirectory.

Visit the GUI Corner home page at [www.prominare.com/prominare/os2mag.vol3num9.html](http://www.prominare.com/prominare/os2mag.vol3num9.html).

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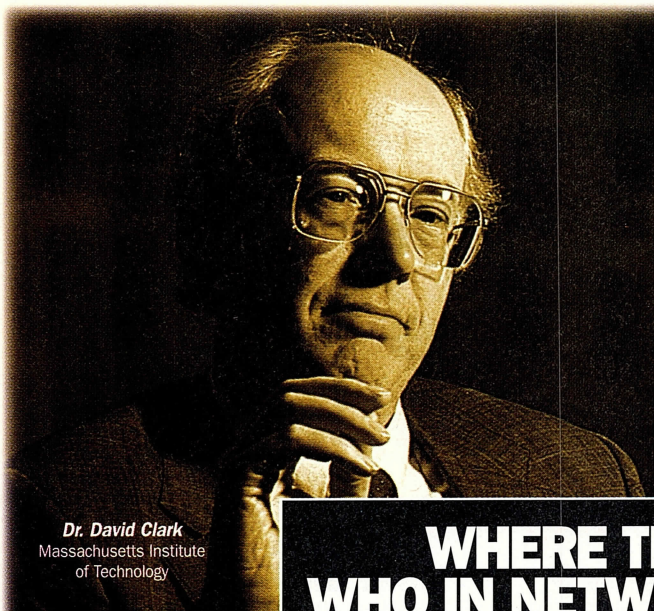


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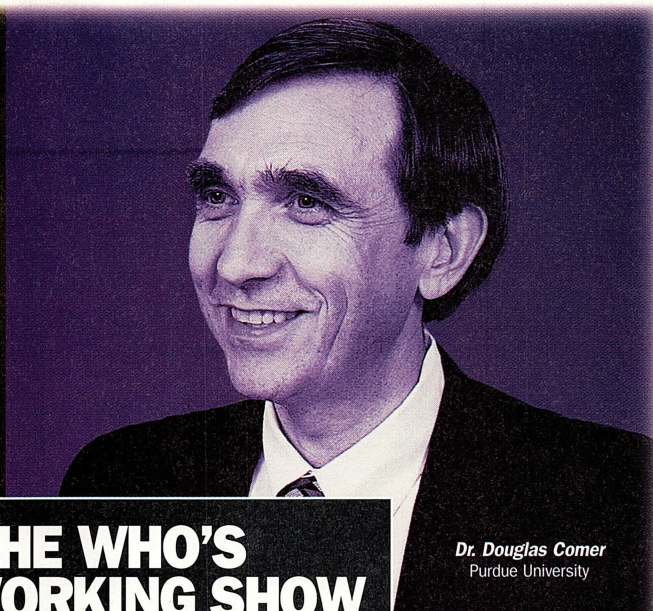
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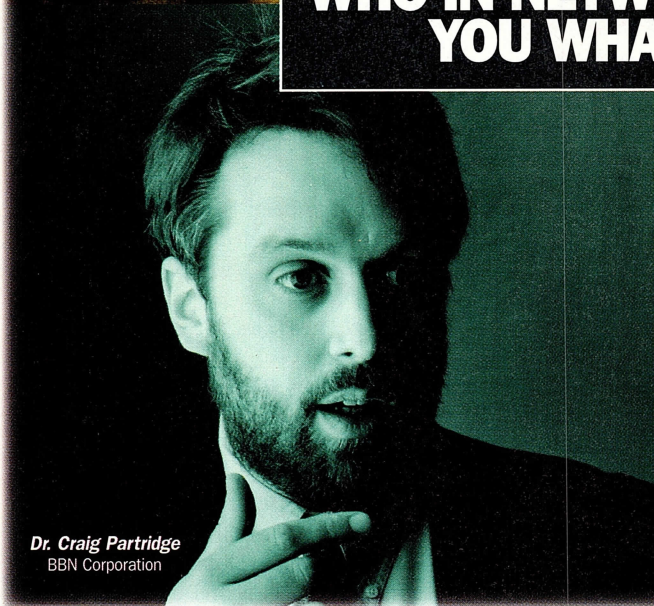


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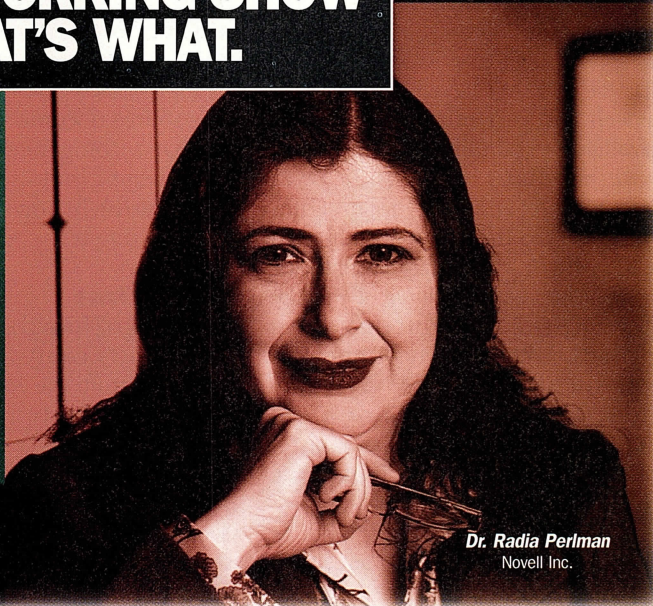


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# Info-ZIP's UnZip REXX Interface

BY DICK GORAN

Info-ZIP has released updated versions of its OS/2 ZIP and UNZIP utilities, along with a *.dll* for processing *.zip* files in a REXX program. This free API was developed by Scott Maxwell and is named *unzipapi.dll*. It is available via anonymous FTP from *ftp.uu.net/pub/archiving/zip/OS2/unz520d2.zip*. The only documentation relating to the API is contained in the file containing the *.zip* source code at the same site in */pub/archiving/zip/zip21.zip*. The API contains seven functions. **UZLoadFuncs()** and **UZDropFuncs()** function like **SysLoadFuncs()** and **SysDropFuncs()** in REXXUTIL. They are used to register and deregister UNZIPAPI. Typical use of **UZLoadFuncs** is:

```
call RxFuncAdd 'UZLoadFuncs',,
              'UNZIPAPI',,
              'UZLoadFuncs'
call UZLoadFuncs
```

## UZVer()

The **UZVer([option])** function returns the version/modification level and, optionally, the creation date of *unzipapi.dll*. The function has one optional parameter of *L*. The data returned by the function is:

```
say UZVer()
5.20
say UZVer('L')
5.20 of 30 April 1996
```

The source documentation, such as it is, that accompanies the source code for *rexapi.c* indicates that a **UzAPI-Ver([option])** function is included, but that doesn't appear to be the case.

## UZUnZip()

The **UZUnZip(parameters[, stem])** function is equivalent to running *unzip.exe* from the command line. The first parameter to the function is a string that contains all of the parameters you would use to launch *unzip.exe* from the command line. If an optional second parameter is specified, it must contain the name of a stem variable where all the lines of output from UNZIP are assigned on a one-for-one basis.

## UZFileTree()

The **UZFileTree(ZIP\_file\_name, 'stem'[, include[, exclude[, option]])** function, which appears to be modeled after the **SysFileTree()** function in REXXUTIL, permits a *.zip*-style file to be scanned for all files within the zipped file. The criteria governing

which files within the zipped file (and what information about each file) are to be returned are specified in optional, positional parameters in the call to **UZFileTree()**. The similarity to **SysFileTree()** ends with the positional parameters for the include and exclude masks. The options parameter would have been better placed as the third parameter for consistency. The format of all the parameters is:

```
call UZFileTree ZIP_file_name,,
              'stem',
              [, 'include_stem'],
              [, 'exclude_stem'],
              [, 'options']
```

The **ZIP\_file\_name** parameter is the file name of the zipped file. **UZFileTree()**, like **SysFileTree()**, returns 0 to indicate success or 1 to indicate failure. The only failure indicated is insufficient memory, which appears to be a relic from 16-bit real addressing. The return code gives no indication of the validity of the contents of **ZIP\_file\_name.stem.0**, which is always initialized, must be used to determine whether any files were returned in **stem.1** through **stem.n**. The default contents of **stem.n** is the file name contained within the zipped file. If the zipped file was created with subdirectories, the contents of **stem.1** through **stem.n** will contain the path and file name. Because the ZIP/UNZIP code is intended to be universal across platforms, the DOS and OS/2 use of a backslash (\) to separate file system elements is replaced with a slash (/) in the *.zip* file and the data returned by **UZFileTree()**. Therefore, it is necessary to replace slashes with backslashes in

### Fragment 1: Parse example for UZFileTree() - F option.

```
parse value stem.i with,
  file_uncompressed_size,
  file_eas,
  file_acls,
  file_date,
  file_time,
  file_path_and_name
file_path_and_name = TRANSLATE( STRIP( file_path_and_name ),,
  '\', '/' )
```



the file information returned by the function. Here is an example of the REXX TRANSLATE instruction that accomplishes this task easily:

```
stem.i = TRANSLATE( stem.i, ,
    '\', '/' )
```

The include and exclude parameters are stem variables that specify files, including those indicated by the wild card characters \* and ?, to be included and excluded in the decompression, respectively. Each 0 tail of the stem variable must contain the number of elements to be considered in each list.

The option parameter may contain O (return file names only), F (return file names preceded by the file's statistics—the equivalent of **unzip -l** from the command line), or Z (return ZIP statistics—the equivalent of **unzip -v** from the command line).

If the F option parameter is specified, the contents of each element within the stem variable returned by **UZFileTree()** contains six fields (unlike **SysFileTree()** which contains five). The fields are: Length (the length of the uncompressed file), Extended Attributes or EAs (the length of any extended attributes attached to the file or 0), ACLs (the size of Access Control List data), Date (the file's date in the same format as it existed on the original file), Time (the file's time stamp in 24-hour notation), and Name (the file system name including directory information separated by forward slashes if it was included when the .zip file was created).

If the Z option parameter is specified, the contents of each element within the stem variable returned by **UZFileTree()** contains: Length, Method, Size, Ratio, Date, Time, CRC-32, and Name.

The **PARSE** instruction should be used to separate the individual fields in much the same way as the technique for extracting the fields returned by **SysFileTree()** is used. Fragments 1 and 2 contain an example of REXX code that can be used to assign the values returned by the F and Z options, respectively. In either case,

### Fragment 2: Parse example for UZFileTree() - Z option.

```
parse value stem.i with,
    file_uncompressed_size,
    file_method,
    file_compressed_size,
    file_ratio,
    file_date,
    file_time,
    file_CRC,
    file_path_and_name
file_path_and_name = TRANSLATE( STRIP( file_path_and_name ), ,
    '\', '/' )
```

### Fragment 3: UZUnZipToStem() example.

```
, mode - Specifies 'F'lat or 'T'ree mode. Umm, this is
hard to explain so I'll give an example, too.
Assuming a file unzip.zip containing:
    unzip.c
    unshrink.c
    extract.c
    os2/makefile.os2
    os2/os2.c
    os2/dll/dll.def
    os2/dll/unzipapi.c
-- In flat mode, each file is stored in
    stem.fullname i.e. stem."os2/dll/unzipapi.c"
A list of files is created in stem.<index>
Flat mode returns:
    stem.0 = 7
    stem.1 = unzip.c
    stem.2 = unshrink.c
    stem.3 = extract.c
    stem.4 = os2/makefile.os2
    stem.5 = os2/os2.c
    stem.6 = os2/dll/dll.def
    stem.7 = os2/dll/unzipapi.c
And the following contain the contents of the
various programs:
    stem.unzip.c
    stem.unshrink.c
    stem.extract.c
    stem.os2/makefile.os2
    stem.os2/os2.c
    stem.os2/dll/dll.def
    stem.os2/dll/unzipapi.c
-- In tree mode, slashes are converted to periods
in the pathname thus the above file would have
been stored in stem.os2.dll.unzipapi.c
The index would then be stored in stem.OS2.
DLL.<index>.
NOTE: All path names are converted to uppercase
Tree mode returns:
    stem.0 = 4
    stem.1 = unzip.c
    stem.2 = unshrink.c
    stem.3 = extract.c
    stem.4 = OS2/
    stem.OS2.0 = 3
    stem.OS2.1 = makefile.os2
    stem.OS2.2 = os2.c
    stem.OS2.3 = DLL/
```

*cont'd on p. 56*



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## The REXX Column

### Fragment 3: Cont'd from p. 55.

```
stem.OS2.DLL.0 = 2
stem.OS2.DLL.1 = def
stem.OS2.DLL.2 = unzipapi.c
```

And the following contain the contents of the various programs:

```
stem.unzip.c
stem.unshrink.c
stem.extract.c
stem.OS2.makefile.os2
stem.OS2.os2.c
stem.OS2.DLL.dll.def
stem.OS2.DLL.unzipapi.c
```

if the .zip file was created with path information, directory entries always have a trailing slash (which you must translate to a backslash).

### UZUnZipToVar()

The UZUnZipToVar(ZIP\_file\_name, file\_name[, 'stem']) function permits uncompressing a specific file from a zipped file into a stem variable or a single variable. If the optional third parameter is not specified, the file being extracted and uncompressed is returned by this function. This action is equivalent to unzipping a file from a zipped archive and reading the entire contents of that uncompressed file with the built-in CHARIN() function. If the optional third parameter is specified, it indicates a stem variable that will be assigned the lines of file\_name on a one-for-one basis. Obviously, this option is not meaningful for files other than text-oriented ones. stem.0 will contain the number of lines assigned to the elements of the stem variable. This action is equivalent to unzipping a file from a zipped archive and then reading the contents of that uncompressed file into a stem variable with the built-in LINEIN() function.

### UZUnZipToStem()

The UZUnZipToStem(ZIP\_file\_name, 'stem'[, include][, exclude][, mode])

function has parameters similar to those described above for the UZFileTree() function with the exception of the mode parameter, which may contain either F (flat) or T (tree). In flat mode, each file is decompressed and assigned to the variable whose stem is the stem name specified in the call to the function and whose tail is the file's name. Assuming abc.zip contains def/ghi/xyz.doc, then stem/def/ghi/xyz.doc would contain the contents of the uncompressed file. In the unzipapi.dll author's words, "Umm, this is hard to explain so I'll give an example, too." Therefore, I have followed suit and included the example and explanation given in rexxapi.c in Fragment 3. **OS/2**

*Dick Goran is the author of The REXX Reference Summary Handbook, an OS/2 reference. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, Lib 6 on CompuServe or FTPed from <ftp://ftp.cfsrexx.com/pub>. He can be reached via e-mail at 71154.2002@compuserve.com.*

### Resources:

Source code to IBM's UnZip DLL for OS/2 (distributed with the Warp BonusPak, WebExplorer, TCP/IP, etc.) at [http://quest.jpl.nasa.gov/Info-ZIP/unzdl2\\_ibm.zip](http://quest.jpl.nasa.gov/Info-ZIP/unzdl2_ibm.zip).

Info-ZIP home page (with OS/2 reference) at <http://quest.jpl.nasa.gov/Info-ZIP/UnZip.html>.



# Back Desk Management

**BACK AGAIN/2 PROFESSIONAL 4.00a, MDESK 1.3, REMOTE SERVICES MANAGEMENT PROFESSIONAL 3.1b**

BY BRIAN PROFFIT

## Back Again/2 Professional 4.00a

**W**hen I reviewed Back Again/2 Professional 3.0a in November 1995, I called it "the best OS/2 backup product I've seen." Since then, other products have been narrowing the gap. But at the same time, Computer Data Strategies (CDS) hasn't been sitting still either—the company has just released a new version of Back Again/2 (BA/2) in an attempt to solidify its position at the head of the pack.

### What's new

The user interface has been improved in several ways. First, the new Quick Start Backup option allows you to bypass the detailed file views completely. Those accustomed to earlier versions, or power users who like to get into the details, can still use the details-view-oriented interface. But you don't have to use BA/2's interface at all. Simply drag a drive, folder, or file onto the BA/2 backup device object, and the backup process begins.

If you prefer to work through using customized BA/2 backup sets, that's easier now also. There is a new Backup Set Template object that lets you tear off a backup set definition and drop it anywhere you'd like. A good place to put those objects is in the new Scheduler folder. This folder allows automated launch of any of the objects within it. These can be backup sets, of course, but they can also be any other objects you want to

schedule for automatic execution—whether or not they're related to Back Again/2. BA/2 has reinforced its position as the backup solution with most flexible scheduling options around.

The stand-alone restore utility seems almost completely different. It is much easier to use, with a graphical look and feel. New indexing technology makes crash recovery significantly easier. The stand-alone restore utility found the entries on tape within seconds and restored them flawlessly to an empty partition. After the restore, I was able to boot Warp from that partition with absolutely no additional manual steps—I didn't even have to run SYSINSTX! All desktop customizations were restored precisely. A program included with BA/2 updated my Warp Utility Disks so that I was able to run the restore utility completely from that set of disks.

BA/2 now has hooks that allows you to execute programs, command files, or REXX programs before and after backups. In a network environment, for example, this feature lets you ensure logons and logoffs as need-

ed. Speaking of networks, BA/2 detects other systems attached to a network and allows backup of their drives as well. This function works with LAN Server, Warp Server, Warp Connect, or Netware. BA/2 can also back up the HPFS386 access control lists used by IBM LAN server or OS/2 Warp Server.

CDS has also substantially increased the number of supported devices. BA/2 has always been the backup product of choice for SCSI tape drives, network drives, Bernoulli and Zip drives, optical drives, and even disk backups. Now BA/2 also supports several ATAPI/IDE tape drives.

### Any bad news?

Version 4.0a is not as well-behaved as its predecessor. During a seek, other tasks come to a halt for a short time. Fortunately, BA/2 allows you to adjust priorities, but I hate to lower the priority of all backup operations just because of the tape-seek problem.

Also, I had some intermittent errors during restore operations. Using the stand-alone restore facility, I was unable to restore one partition. About 85% of the way through the restore, the program stopped dead and returned me to the A> prompt. When I retried, the problem recurred at the same point. Doing a fresh backup and trying Restore again removed the problem, so it was possibly a problem with the backup. Nevertheless, I had successfully verified the original backup. Besides, if there's a bad spot on the tape, there has to be a more graceful way to handle the problem.

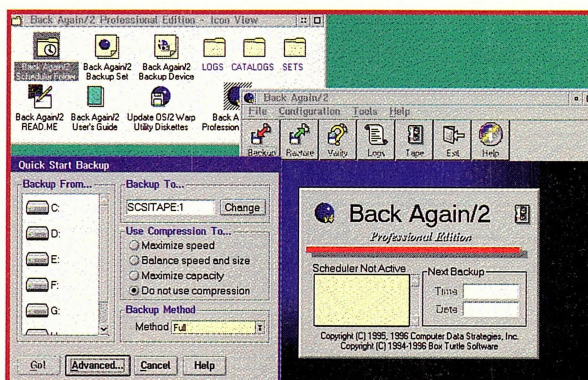
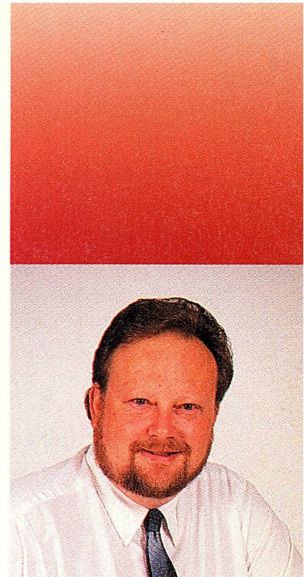


Figure 1: Back Again/2 has an updated user interface.





## Glee or flee?

Those backing up to disk or network drives don't have to make a decision. The personal version hasn't been upgraded to 4.00. For tape users though, the new indexing technology saved me nearly an hour when I restored to a blank disk during a simulated complete crash. The time-savers were largely the elimination of the preliminary steps of reading through the entire tape to create a catalog and the removal of the manual steps required to get OS/2 on the disk's boot sector. IS departments will be pleased to hear that by the time you read this review, CDS will release a version with autoloader support.

I hope version 4.01 comes out quickly so as to address the stability concerns, though I did manage to work around and recover from each difficulty I had. Overall, the advantages of 4.00a make these difficulties tolerable.

If you already have BA/2, you should consider upgrading. If you don't have BA/2, call CDS to find out whether your hardware is supported. It's my backup software of choice.

## MDesk 1.3

**I**s bigger, fancier, and richer in function always better? Not according to John McCalla, who wrote MDesk for users whose hardware isn't up to the demands of the Workplace Shell (WPS). MDesk is a GUI shell that can be used within the WPS or as a replacement for it.

### Why do I need it?

When OS/2 Warp was released, IBM told the world that it would run on 4MB systems. Well, limp is perhaps a better word for it. MDesk is most useful in systems that don't have much RAM, because it uses about 2MB less memory than the Workplace Shell. That can make a real difference in the amount of swapping required, and therefore can improve system performance noticeably.

The documentation claims it "has been shown to be significantly faster than the WPS, even on systems with 16MB of RAM and more." Possibly so,

because there is less function and thus less code. However, in general use, I didn't notice a significant speed difference. If you think about it, most of your time is spent in program execution, not WPS activities. Primarily, speed will improve in low-memory situations of about 8MB RAM or less.

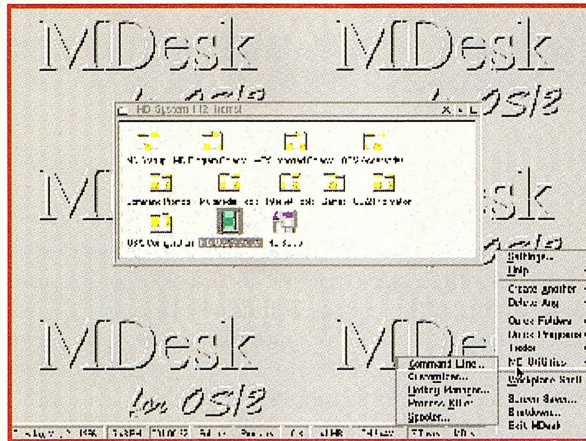


Figure 2: MDesk comes with an Info Bar and various utilities.

### What do I give up?

The easiest way to lower storage requirements in a program is to remove function, so naturally you would expect some WPS capabilities to be missing from MDesk. The first difference you'll notice between MDesk and WPS is cosmetic; icons aren't scattered around the desktop. In fact, there really isn't a "desktop," except as a place to hold windows. All available objects are contained in the MD System folder and cannot be moved to the desktop.

During installation, MDesk creates a set of folders covering basic OS/2 operations, including programs from the BonusPak. Any customized objects or folders you might have created are gone. To help the migration, I strongly suggest that you initially tell MDesk that you want WPS to continue as your system shell. Under WPS, you can start MDesk and drop your customized objects onto the MDesk Import Utility icon. That moves those objects into an MDesk folder labeled WPS Imported Objects. They can then be accessed from that folder when MDesk is the system shell. There's a slight catch, though. If you didn't specify a working directory in a program's Settings notebook, WPS defaults to the same directory as that from which the program was loaded.

Under MDesk, you have to specifically identify a working directory or click in a checkbox that says you want it to be the same as the program directory. Several of my applications required this manual adjustment before they would work with MDesk.

Another significant difference is that the only object types are programs and folders. Consequently, you cannot drag and drop a file icon onto programs or devices nor can you double-click on a file icon to load a program and open the file—you can't do these things because file objects don't exist. In fact, there isn't even a Drives object. And while no printer objects exist, a spooler utility does handle printed output. It doesn't include all of the functions of the WPS spooler, but it handles most needs. You can't install new printers, though, from within

MDesk. Fortunately, switching back and forth between MDesk and WPS is fairly simple, although it does require rebooting the system.

You don't have the wide range of customization options that WPS offers either. For example, there are no color or font palettes. Instead, MDesk includes the Customizer, which allows you to choose from the basic 16 VGA colors and the fonts supplied with OS/2 in three sizes.

Finally, some programs, such as Object Desktop, Relish, and cc:Mail, require the WPS and cannot run if MDesk is the shell.

### What do I get?

The news isn't all bad, however. In fact, MDesk has some features that WPS doesn't offer. The Info Bar at the bottom of the desktop contains useful information, as well as access to several functions. In addition to date and time, the Info Bar shows the time elapsed since the shell was started. (I'm sure that's useful for something.) Next comes buttons that activate roll-up menus containing two of the folders that MDesk created at installation and the command windows and user's guide. You can customize these entries to contain whatever objects you use most frequently.



Those buttons are followed by a CPU meter, which estimates the percentage of the CPU's power that is currently being used by active tasks. That is followed by an estimate of the available virtual memory in your system and the current size of your swapfile (and available space into which it can grow). The button showing the number of active tasks can also be clicked upon to roll up a list of those tasks allowing you to switch to the desired one. Clicking on the MDesk button rolls up a menu of all of the objects found in the MDesk System folder. Double-clicking anywhere on the Info Bar brings up a small graphical command line that allows you to enter commands. This is a single-line field, however, so you can't do interactive things like **dir** listings. Right-clicking on the Info Bar pops up a menu that allows you to configure and run the various aspects of MDesk.

MDesk adds the Ctrl-Tab session switching with which Windows 3.1 users are familiar. Opening programs and folders is also made easier by allowing the user to assign hot-key actions to <Ctrl+Shift+[key]> or <Ctrl+Alt+[key]> combinations. You can then open any folder or program with a simple hot-key sequence.

Other additions include the popular X button in the window titlebar to close the window with the single click. I really like the cool 3-D look to the window frames. The SSAVER Deskpic-compatible screen saver program is integrated into MDesk, and a Process Killer utility terminates those programs that just refuse to die on their own. With a single click you can assign DOS/Windows programs a group of settings designed to work best for text applications, Windows/graphical applications, or games/graphical applications. But it isn't obvious—you have to know to right-click in a certain place in the dialog or you'll never find out about these goodies.

### Glee or flee

Since all of the additions are available

by running MDesk within the WPS, you don't have to be a low-memory user to get value from this program. (Truthfully, if you're trying to run OS/2 Warp on a 4MB system, you need more help than MDesk or any other program can give you.) And because it's shareware, it won't cost you anything to take a look. While you're at it, you owe it to yourself to compare MDesk to a similar shareware program called TaskBar. Although many of the advantages of MDesk are standard in Merlin, the number of additional features in Merlin, not available in MDesk, makes the sacrifice much greater.

## Remote Services Management Professional Edition 3.1b

**F**irst released as PolyPM/2, Remote Services Management (RSM) 3.1 is the latest enhancement to a product that continues to offer users more options for remote control of computers. Whether for a classroom, help desk, or even for the business traveler who occasionally

ter(s) can be connected in a variety of ways, including direct connection through null-modem cables, telephone network connection through modems, private X25 or ISDN networks, LANs using NetBIOS and IPX-SPX, or even across WANs using APPC-APPN or TCP/IP. Additionally, RSM allows more complex connections through manager and client gateways. If you need to control several systems on a LAN remote from the manager, you need only install the client gateway on one of those systems. The manager can then connect with that gateway system (via any of the techniques mentioned earlier), and control any of the clients on that LAN. Likewise, corporate technical support departments don't need separate connections for each system that might need to control others. Installing the manager gateway software on one of the systems on the support LAN allows each of the manager systems to access clients through that single point of connection.

Both 16- and 32-bit versions of the manager are included, so it can run on any version of OS/2 from 1.3 through Warp. The client software also includes 16- and 32-bit OS/2 versions, plus Windows and DOS clients. The corporate support desks that have to manage Windows users don't have to give up OS/2 to do it! From their OS/2 system, they can control DOS and Windows clients.

The resolutions of the manager and client don't have to be the same either. In fact, the client can have a higher resolution than the manager, although that can cause a fair amount of scrolling around (or visibility difficulties as the client display is compressed into the manager's window).

With the added RSM toolbar taking up real estate on the manager display, I found it to be far easier to use when the resolution of the manager system was higher than the client's.

### Performance

The resolution of the client's system has an effect on performance as well.

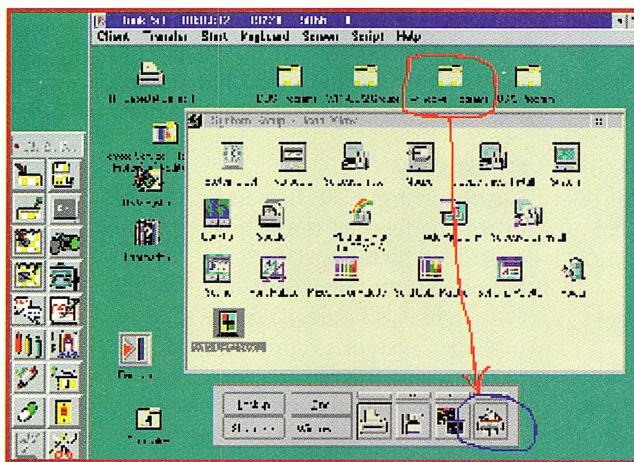


Figure 3: RSM's toolbar includes colored markers to highlight items on the client display.

needs more than what a remote access product can offer, RSM provides a straightforward, secure way for one computer to take control of others.

### Multiple connectivity options

The manager (controlling) computer and the client (controlled) compu-



The more pixels and colors on the client display, the longer it takes to transmit all that information to the manager. You can tune this a bit, though, to speed things up. Regardless of the color depth of the client system, you can restrict the color information that is transmitted to the manager to 256 colors, 16 colors (twice as fast), or monochrome (twice again as fast).

Performance is so improved in this version that I found even 9600bps modem connections provide tolerable, albeit sluggish, performance with 16 colors. Across faster connections, performance is great. For best performance, you might want to take advantage of RSM's ability to run full-screen OS/2 and DOS sessions in text mode on the client whenever possible.

### Remote software updates

RSM offers file transfers in both directions between the manager and the client. Data compression keeps performance good, and the protocol used provides for automatic restart if the connection is lost during transfer, making it easy for the centralized IS department to roll out software updates across the enterprise.

The included Programming Script Language (PSL) makes things even easier by automating such tasks. More than a command language, PSL includes a GUI builder to allow graphical controls in your scripts. More than 100 functions simplify script development. But I would still prefer to use REXX than have to learn a whole new language for one product.

### Interface

If the manager system has a higher resolution than the client, you can see the entire client screen normally, as well as the RSM toolbar (Figure 3). As you move the mouse within the RSM window, the pointer moves on the client system as well, which is especially useful in teaching situations, where you want the remote user to see exactly what you're doing.

Within that window, your actions are treated as if the client had entered them directly into that system. Open and close windows, execute programs, and modify files as the user sees what's happening. You can also copy

back and forth between the manager's and the client's clipboards. Because <Ctrl+Esc> on the manager is intercepted by OS/2 on that system, an entry on the RSM toolbar causes a <Ctrl+Esc> to be sent to the client, bringing up that system's Window List.

For clearer communication with the remote user, the toolbar includes colored markers that allow you to draw on the client's desktop to highlight things. You can also go into chat mode, allowing the manager and client to type messages directly to each other. Don't forget, though, that when the connection is first started, the client's mouse and keyboard are de-activated. If you notice that a user hasn't responded to the question you sent, chances are good that you forgot to give back control of the keyboard.

At installation, RSM asks if you would like to have the software automatically loaded at boot time. This option can be very valuable, because one of the things you can do from the manager is actually reboot the client system. If you have modified the client's *config.sys* file, for example, you might want to re-boot to put your changes into effect. With the client software being restarted automatically, you can regain control after the boot and verify that your changes are working.

### Security

Security is tight; each manager has a list of clients they can activate that is controlled by the specific license number of RSM installed on those clients. The clients also must have the specific manager system's name and license number authorized. Passwords prevent unauthorized control.

Journal files can also be maintained on manager, manager gateway, client gateway, and client systems. You can elect to track each connection with date and time stamps and the ID of the connecting system. The journals can include a list of all files transferred and messages exchanged during chat mode. You will also want to peruse the journals for messages indicating refusals of access attempts.

### Glee or flee

The biggest complaint I have with

RSM is the technical support policy. The (excellent) manual stresses several times that International Software Solutions expects you to go to your dealer for support. The only direct support option it offers is through CompuServe. The other complaint I have is that ISS didn't provide an uninstall routine. When will vendors learn?

Apart from that, RSM provides an excellent solution for those with remote control needs. If the technical support problem is an issue, I suggest you contact ISS directly and express that concern. I suspect if you're considering the purchase of enough licenses... **OS/2**

*Brian Proffitt left IBM's OS/2 team to become director of PC Week's Corporate Labs. Now president of Visionary Research, senior contributing editor for OS/2 Magazine, and solutions advisor to PC Magazine, he can be reached at 75300.1466@compuserve.com.*

### Resources:

#### Back Again/2 Professional 4.00a (\$149; Upgrade from other OS/2 backup products \$79)

Computer Data Strategies  
(800) 284-4156, (612) 730-4156  
Fax (612) 730-4161  
BBS (612) 730-4157  
E-mail [sales@cds-inc.com](mailto:sales@cds-inc.com)  
READER SERVICE NO. 111

#### MDesk 1.3 (Shareware registration: \$25)

John McCalla  
E-mail [johnm@cs.mcgill.ca](mailto:johnm@cs.mcgill.ca)  
WWW <http://www.cs.mcgill.ca/~johnm/mdesk.html>  
READER SERVICE NO. 112

#### Remote Services Management Professional 3.1b (\$499)

International Software Solutions USA  
(407) 820-0802  
Fax (407) 820-0804  
WWW <http://www.iss2you.com>  
CompuServe: GO OS2BVEN section B  
READER SERVICE NO. 113



**W**hen you installed OS/2 Warp, you may have chosen to install UltiMail Lite, an Internet electronic mail package from IBM that's included in the BonusPak. But if you're like many people, you then found UltiMail to be not very light at all. Sure, it will perform the basic functions of sending and receiving occasional messages. If that's all you need, great. What's more, IBM has told us that UltiMail Lite *won't* be in the next version of OS/2 Warp, code-named Merlin, but will be replaced with Lotus Notes Mail.

If you make regular use of e-mail and therefore need advanced functionality, or are looking for a solution that'll have more longevity than UltiMail Lite, you might consider an alternative. Three popular choices are the Internet e-mail packages we review here: Southside's PM Mail 1.5, Innoval's Post Road Mailer 1.03a, and Nick Knight's MR/2 Internet Cruiser Edition (MR/2 ICE) 1.0.

In any healthy application marketplace, competitors busily leapfrog each other; one product is the obvious "winner" until another company releases its next version. That's certainly the case here. PM Mail just released version 1.5, and the metaphorical ink on MR/2 ICE 1.0 is barely dry. As a result, the oldest, Post Road Mailer, suffers in comparison. Keep in mind, though, that Post Road was the first to offer e-mail features that are now commonplace; Innoval expects to have its next version in late testing by the time you read this review (which they claim will leapfrog the others, yet again). Among Post Road Mailer's upcoming features is the ability to send and receive faxes by way of the Internet.

### Electronic penmanship

For the basics of sending and receiving an infrequent message, all three programs do a fine job. Variance is simply an issue of user interface, which is a purely personal evaluation. In the several weeks during which I used all three of these programs, my own preferences shifted from one program to another and back again.

(So did my e-mail. I learned that MR/2 ICE has the most extensive address-book import utilities, though that's unlikely to be a feature most users test more than once.)

The real differences begin to appear when you deal with a lot of messages. I get between 30 and 100 e-mail messages a day, and on some days I send nearly that many. Post Road Mailer is particularly irksome, because it sends and receives messages in batch mode. If I have 114 incoming messages, Post Road makes me wait until all 114 have arrived before I can read the first one. MR/2 ICE's message receive/send threading is the best of the lot, at least from the point of view of reading messages while others are downloading. With PM Mail, although I could read a message while others were arriving, the program sorts messages in an awkward way that makes me lose track of ongoing conversations. PM Mail also doesn't tell you how many messages are in a given message window or folder; I like to be reminded that I've accumulated 320 messages in my Inbox, or I get lazy about cleaning up. Both Post Road and MR/2 ICE provide this information. PM Mail and MR/2 ICE can also preview messages before downloading them.

All three programs let you automatically file or reply to messages based on subject or content. For example, if you run a technical support center, you can automatically file messages that mention "beta bug report" into the New Product folder, and deal with them all at your

leisure. Messages with subjects containing "dark chocolate" can be filtered and automatically responded to with boilerplate text (complete with file attachments, time stamps, and other up-to-the-minute information). MR/2 ICE has the most options for managing automated response and message management, especially since it has the ability to link to REXX procedures. Still, you should be able to accomplish the task with any of these programs.

Once you've accumulated several e-mail messages, you need text-search features, or you'll have to manually check each message to find the one containing the budget recommendations. Post Road is considerably weak in text searches. You can search through messages based on similar "thread" topics, but that won't help you find a phone number buried inside a random message. (Innoval says that the next version will let you search through multiple folders, in headers, subject lines, and full content, yielding an opened folder of notes matching your search criteria.)

When you search for text in MR/2 ICE, the program selects (highlights) the messages that fit your criteria; this could be a fast way to organize your messages, because with only a few more clicks you can move all the selected messages to a folder. PM Mail uses a Find dialog that (very quickly) searches through all the messages in an account, displaying them in a manner that makes it easy to browse through messages, but provides no way for you to do anything

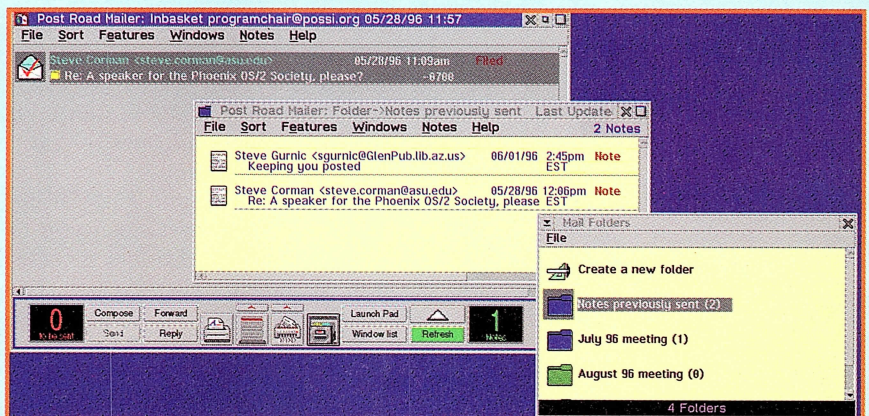


Figure 1: Post Road Mailer uses large, clear icons that easily communicate what you've done with a message.



# Review

with the collection except read them. Depending on what I want to do with the message I seek (move it to where it belongs? find a rogue telephone number?), I waffle about which method I prefer.

All three programs let you organize your messages into folders. Post Road shows its age here; folders operate very slowly, and they are hard to navigate. Only PM Mail permits folders within folders. On the other hand, PM Mail doesn't let you create a new folder on the fly. If, for example, I want to save a message in a folder called "OS/2 Magazine" and I haven't created one yet, I have to hop back to the main menu to do so. It's far from a bug, but since the other two programs let me add a folder when I'm in the middle of filing a message, its lack here vexes me.

## The write stuff

I like the user interface for message writing in all three products, though they vary slightly in capabilities. Both MR/2 ICE and PM Mail include a spelling checker. MR/2 ICE makes it easy to insert dates (in various formats) and special characters and also has a thesaurus. All three programs permit you to attach files to a message. Post Road supports MIME attachments. (MIME is one standard way of transferring eight-bit binary files through the seven-bit Internet.) MR/2 ICE attaches uuencoded files but (if you download a few freeware utilities) can detach MIME, uuencoded, and binhex formats. (Uuencoding is a way of transferring binary files that originated from the UNIX environment; binhex is a Macintosh protocol that serves the same purpose.) Only PM Mail lets you attach more than one file to a message.

PM Mail and MR/2 ICE have a nifty application-linking feature. If your correspondent mentions a Web page or FTP site in her message, all you have to do is highlight the text and right-click on it. The e-mail program will start the WebExplorer (or other browser—you can specify your preference in MR/2 ICE) to bring you right to the spot. However, no provision exists to create a bookmark to check the Web site later, in case you're not

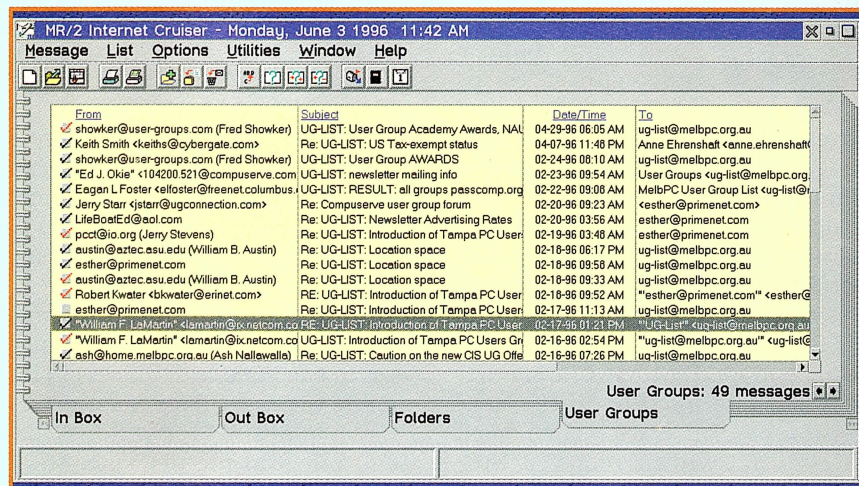


Figure 2: MR/2 ICE uses a tabbed notebook for folder management. Its user interface is simple and straightforward.

connected to the Internet while you're reading messages. If you right-click on an e-mail address, PM Mail lets you add it to the address book or send a message to the address.

I keep in touch with several hundred people, and I have phone numbers and e-mail addresses scribbled in many unlikely places. So the ability of an e-mail program to efficiently manage contact information is an important item for me. Each of these programs handles the task differently, but they are far from perfect.

With dozens of correspondents, I need the organization that comes from grouping addresses together in a logical fashion. When you add e-mail addresses in MR/2 ICE, they go into one long list, from which you can construct groups. Adding people to groups is tedious in MR/2 ICE and Post Road Mailer, since you have to select the people to include from a list that could be many pages long. (You can also create a group by referencing a separate text file that contains the Internet addresses that you want to use in a group.)

Post Road Mailer and PM Mail require (or at least encourage) you to add addresses into folders or categories; Post Road Mailer lets you construct groups within those categories, but PM Mail does not. You're essentially given a choice of creating an address entry and then having to figure out where it should be grouped, or given a group into which you

insert the address entry. Neither of these methods works for my needs. My friend Steven should be included in groups for "writers," "folk music fans," and "joke list recipients." I should be able to put a keyword in Steven's address record that makes it easy to tell the application to create a group by searching through the address database for any record including the word "writer."

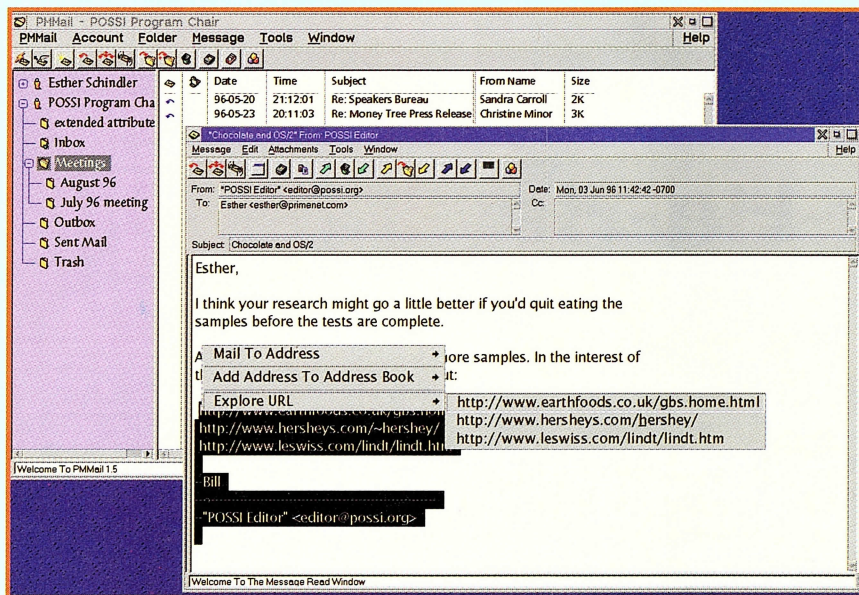
In PM Mail, I can copy Steven's record to three different groups, but if he changed Internet addresses, I would have to find and change all of the records. PM Mail should, at least, create a shadow of the record. (Shadowing would be nice for message folders, too, so that topics that cross over a category line can be easily managed.) I'd really like to be able to drag people to groups (or vice versa) in the manner that OS/2 Warp Server provides for user administration.

While I'm at it, why *are* these programs creating independent address books? Why not at least give me the option of using one of the half-dozen phone books already installed on my hard disk? (I hate looking through four databases to find someone's address!)

I subscribe to a handful of Internet e-mail-based mailing lists (generally called list servers, or listservs). The three e-mail packages treat all the messages received as ordinary e-mail, but I wish they would do more. For example, I'd like the e-mail pack-



# Review



**Figure 3: Highlight text in a PM Mail message and right-click. PM Mail can start the WebExplorer as well as send e-mail to addresses it understands.**

age to recognize when I add a listserv member to my address book and automatically note (perhaps in a comment) that they're a member of that listserv; it would make it easier to incorporate that individual in a private group. PM Mail makes it difficult to add a listserv to the address book without typing it in by hand.

In general, the WPS integration in these programs is limited to minimal drag and drop. None will let you drag and drop a message to the desktop, and only PM Mail lets you drag and drop a message to a printer object. All do a good job of multithreading their operations.

All of the programs support multiple account management. In this regard, PM Mail stands well out in front; its user interface makes the accounts visually distinct. Nevertheless, I'm not completely thrilled with the applications' navigation between accounts. I have two active Internet e-mail accounts, which I like to keep separate most of the time. However, sometimes I receive messages with one account that should be handled by the other. If I get a personal message on the user group e-mail account, I might like to store the message in a personal folder. In PM Mail, I can drag and drop the message across accounts, but I can't categorize

it from the menu provided in the message window. Post Road Mailer keeps separate address books and address groups for each account, which makes cross-navigation difficult. (In some cases, this might be a good thing.)

The documentation for all of the e-mail packages is good, but it's 100% online. While I appreciate good online documentation, I yearn for a solid print manual as well—even if it costs a few extra dollars. Online documentation makes it easy to figure out "what am I supposed to fill in here?" but it doesn't encourage you to browse through the manual to discover what else you can accomplish. Since these programs are all rich in features, unless you make a deliberate effort to read everything in the online documentation, you're sure to miss something.

## Mail call

In case you hadn't figured it out by now, there's no big winner or loser here. Happily, all of the programs are very good; it's hard to go wrong no matter which one you pick. Since demo versions are available for all three programs, you can easily experiment on your own. But here are some guidelines to help you choose the best one for your own needs.

Post Road Mailer is available in two versions; one supports Internet e-mail, and the other also works with IBM mainframe mail, using PROFS. If your idea of connectivity involves big computer systems, Post Road Mailer may be your best choice.

For managing several active accounts, I like PM Mail best. I also prefer PM Mail's folder management, since its folders-within-folders helps me organize my messages. Yet I much prefer the address book capabilities in MR/2 ICE. If you can categorize yourself as a message receiver (that is, a packrat) rather than message sender, your choice might be easier. After using all three packages for several weeks, I find that I still haven't made a solid decision about which one will stay on my computer. **OS/2**

*Esther Schindler is senior contributing editor of OS/2 Magazine and author of The Computer Speech Book. You can reach her at [esther@primenet.com](mailto:esther@primenet.com) or on CompuServe at 72241,1417.*

## Resources:

### MR/2 ICE (\$25)

Nick Knight  
(800) 414-4268  
WWW <http://www.wilmington.net/bmtmicro/info/placeorder.html>  
or <http://nick.secant.com>  
READER SERVICE NO. 100

### Post Road Mailer (\$49, \$64 with newsreader, \$79 with PROFS support)

Innoval Systems Solutions Inc.  
(914) 835-3838  
Fax (914) 835-3857  
WWW <http://www.aescon.com/innoval/index.htm>  
READER SERVICE NO. 101

### PM Mail 1.5 (\$40)

SouthSide Software  
(800) 414-4268  
WWW <http://www.southsoft.com>  
READER SERVICE NO. 102





# Java Brew-Ha-Ha

BY STAN KELLY-BOOTLE

Is Sun Microsystems' Java (more precisely, The Java Programming Language) a fad or the ultimate magic linguistic bullet that will slay all our software-engineering dragons? I've been browsing the flood of thirty-some-odd books on Java, and it's hard to escape their evangelical agenda.

Java certainly qualifies as a fad if you consider its sudden, hyperactive omnipresence in the literature, claiming to be *the* Internet language and software development system. Sun seems to be fanning these flames by ruthlessly enforcing its Java™ trademark à la McDonald's, even against long-established, bona fide purveyors of *real* coffee! The caffeinated hype is also being exploited by product names borrowing mindlessly from every aspect of the coffee trade. Three cheers for *Café OLE*. Avoid *Espresso*, though, unless your JVM (Java virtual machine) runs on a Cray. On the bright side, *HasBean* is now intended as a compliment.

But if you delve deeper, Java has many nonfad characteristics. Java is brilliantly eclectic and nonoriginal. It takes the syntactic sour cream from C/C++ (while dropping such dangers as global functions, pointers-to-whoknows-where, arrays-as-pointers, multiple-class inheritance, and #include header files), and adds the import mechanisms of Modula-2 and the garbage collection and "interface contract" theology of Eiffel. The cross-platform advantage of Java, based on the relatively slow interpretation of byte code by a JVM, owes much to the UCSD Pascal of 1976. Java applets can be embedded in any HTML docu-

ment, so we seem to have a fad riding on a super fad (WWW). The reaction of the C++ community is interesting. Some have jumped ship, seeing Java as a "better C++," a general programming language beyond its immediate Internet appeal. Others urge caution, pointing out that C++ has painfully and democratically evolved (1979-1996) to an ANSI standard (see *The Design and Evolution of C++* by Bjarne Stroustrup). Already, Java is being subjected to the nitpicking to which all languages are heir.

The Java advantages appeal to the NC (network computing) philosophies of IBM and Oracle, and potentially threaten Microsoft's model of the ever-exploitable client desktop. But, are we, yet again, demanding hardware solutions to software problems?

The Java book situation is relatively easy to resolve. I've reduced your search to Addison-Wesley and Coriolis Group Books. Both companies have issued general and specific Java titles. The Addison-Wesley texts are authored by the creators of Java and aimed at a computer-scientific audience. The Coriolis titles are more down-to-earth, with gritty, real-world programming examples. To glean an overall view of Java, I suggest *The Java Programming Language Handbook* by David H. Friedel, Jr. and Anthony Potts (Coriolis Group Books, Scottsdale, Ariz., 1996, 414 pages, \$24.99, ISBN 1-883577-77-2). If you are more formally CS-inclined, you may prefer *The Java Programming Language* by Ken Arnold and James Gosling (Addison-Wesley Publishing Co., Reading, Mass., 1996, 333 pages,

\$34.38, ISBN 0-201-63455-4). Both books cover the essentials of the Java syntax and its rationale.

Moving from theory to applications, you should consider *Writing Java Applets* by John Rodley (Coriolis Group Books, Scottsdale, 1996, 430 pages plus CD-ROM, \$39.99, ISBN 1-883577-78-0) and *Java Programming Explorer* by Neil Bartlett, Alex Leslie, and Steve Simkin (Coriolis Group Books, Scottsdale, 1996, 820 pages plus CD-ROM, \$39.99, ISBN 1-883577-81-0). If you are still seriously hooked on Java, you'll need some formal API documentation from *The Java Application Programming Interface—Volume 1: Core Packages* (ISBN 0-201-63459-7), *Volume 2: Window Toolkit and Applets* (ISBN 0-201-63459-8)—by James Gosling, Frank Yellin, and The Java Team (Addison-Wesley Publishing Co., Reading, 1996).

## Postscript

If you care about the grand sweep of history, this column starts the third year of my *OS/2 Magazine* book reviews and residual ramblings. Sincerely obsequious thanks to Alan Zeichick, Theresa Mori, Tor Berg, Amy Wu, and all the previous editorial staff that I have outlasted. And especial gratitudes to those readers who clog my e-mail bandwidth. **OS/2**

Stan's latest book is *The Computer Contradiction* (MIT Press). He welcomes e-mail via [skb@crl.com](mailto:skb@crl.com). Try his Web page at <http://www.crl.com/~skb>.



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## 5 Access Control Policy Facility

Manage access to desktop resources such as objects, windows, and workspaces, with all activities subject to auditing.

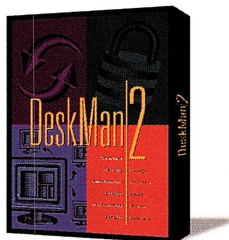
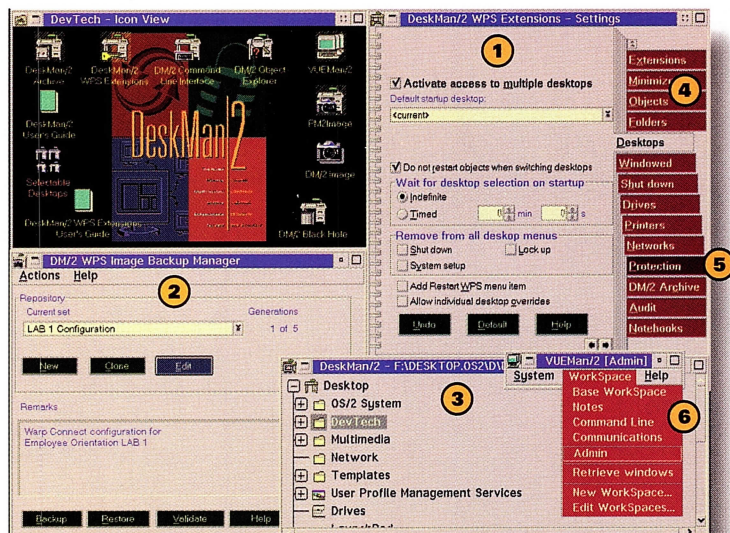
## 6 Workspace Facility

Define separate, named PM work areas, each with its own windows, task list, desktop, and context sensitive tools to organize your many daily activities. Check e-mail in one window, surf the Web in another, and still work on multiple projects in others!

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Development Technologies, Inc.  
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**NEW**

## ● **Application Mover**

The best desktop repair and maintenance toolkit for OS/2® just got a new power tool with UniMaint application mover! The application mover moves applications from one partition to another - without the tedious chore of deleting, reinstalling and recustomizing applications. UniMaint also updates system INI and CONFIG.SYS files automatically too. Moving those large applications to the network hard drive is a breeze with UniMaint's application mover.

## ● **Uninstaller**

Your hard disk is littered with files leftover from the programs you no longer use, or old versions of programs you have since upgraded. The new and improved UniMaint Uninstaller is designed to delete unwanted applications, update INI and CONFIG.SYS files, remove program DLLs, and deregister classes automatically. UniMaint also identifies orphan DLLs for removal.

**NEW**

## ● **Ease of Use**

New function wizards make OS/2 maintenance easy for even new OS/2 users.

## ● **Portable Desktop Backup**

## ● **Global WPS Settings**

## ● **Desktop Repair**

"If you run OS/2, you need UniMaint."

Geoffrey Hollander, OS/2 Professional, February 1996

"... a requirement for serious users and I/S departments"

Brian Proffit, OS/2 Magazine, November 1995

**Make UniMaint an essential complement to your existing desktop utilities today!**

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